Utility-Supplied Heating-Cooling? . . . . . Pg. 6

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✓ INSIDE THIS ISSUE

'EGG CRATING' of modern office space creates problems for air conditioning engineer 2
NEW PSYCHROMETRIC chart issued by ASHRAE .. 5
UTILITY-SUPPLIED HEATING COOLING—Its advantages outlined by civil engineer 6
AUTOMATED CHECK HANDLING SYSTEM requires positive, reliable temperature and humidity control 10
GSA INSTALLS AIR-COOLED CONDENSERS to cut maintenance costs, improve reliability in government buildings ... 20
MOISTURE INDICATORS—Engineer questions some statements made in NEWS article 22
MANUFACTURER EXPANDS LABORATORY facilities for developing, testing residential air conditioning equipment . 26
EDITORIAL 14
OFF THE CHEST 14
WHAT'S NEW 18
TECH CENTER 25
PATENTS 30

Builder To Use Carrier Cooling, Heating In 10,000-Home Project

CHICAGO—Ralph E. Staggs, president of Staggs-Bilt Homes, Inc., Phoenix, Ariz., last week announced an agreement with Carrier Air Conditioning Co. for equipment for 10,000 homes in Park Phoenix, which he described as the largest single residential development in any U. S. city.

He estimated that $9,000,000 would be involved in provision of Carrier furnaces and refrigerated cooling for the Staggs-Bilt residential program by two Phoenix dealers.

The dealers involved are

(Continued on Page 29, Col. 3)

ARI Approves Training Program

To Set Up Public School Courses In Cooling

WASHINGTON, D. C.— The Air-Conditioning & Refrigeration Institute will sponsor development of a training program to provide qualified installation, service, and maintenance men for refrigeration and air conditioning equipment, the board of directors and membership of the institute voted at Hot Springs, Va.

Machinery to carry out the program, which will be aimed at establishment of courses in public school facilities in various cities throughout the country, probably will be set up in the next few months.

It will necessitate the addition of an ARI staff member whose primary duties will be the establishment and maintenance of contacts with local school officials and groups of service contractors working with such officials on local programs.

A budget item of $25,000 was approved for the program during 1962, on the recommendation of ARI's Training Program Committee, headed by A. E. Meling of Carrier Air Conditioning Co.

Other members of the committee include Harry C. Gurney of Janitrol, Coit B. Lytton of Lennox Industries, Inc., and George E. Mills, public relations director, and Frederick J. Reed, chief engineer, both of the ARI staff.

In addition to contacting school officials, many of whom already have expressed interest in inaugurating air conditioning

(Continued on Page 29, Col. 4)

Attack Direct Selling

NHAW Wholesalers Stress Closer Working Relationships with Mfrs.

By George M. Hanning

CINCINNATI—Need for closer working relationships between wholesaler and manufacturer was a constantly recurring theme at the 15th annual convention of the Northamerican Heating & Airconditioning Wholesalers Assn. here recently.

Both incoming president R. B. Hesling of Van Nuys, Calif. and outgoing president J. Orville Garrett of Greensboro, N. C., urged support of those suppliers who consistently market their goods through wholesalers and "awareness of" those who took to direct selling, discount houses, "short line" wholesalers, and the like.

Other convention highlights included:

● Announcement of a new correspondence course in basic heating for use by wholesalers in training their dealers and salesmen. Other courses in basic cooling and advanced combination heating and cooling are expected to be ready during the coming year.

● Announcement of a proposed Profit Planning Institute that would give practical information on how to run a company from the financial point of view. The five-day institute is scheduled for Feb. 4-9 in Chicago.

● Plans by the air conditioning committee to work up a check list for dealers which the dealer can use to inform the homeowner what a quality installation consists of, what it takes to get that quality installation, and how to sell themselves as qualified to make such an installation.

● A practical session on how to conduct a market survey and how to use the information gathered to help set sales quotas and improve inventory control.

● A study of cash-and-carry competition which revealed that

(Continued on Page 28, Col. 1)

American-Standard Bows Split System For Small Homes

NEW YORK CITY — Two "low-cost pre-charged split system air conditioners with unique installation features" have been introduced by the Air Conditioning Div. of American-Standard, along with a new line of electric furnaces.

According to Clyde H. Wilkinson, division president, the new systems permit central air conditioning of small homes or apartments for an installed cost of about $500 in new construction applications. Modernization applications should be only slightly higher, he said.

This low price is made possible, according to Wilkinson, because new factory production facilities and product design have greatly reduced both the cost of equipment and the time and cost of installation.

The new systems consist of a factory pre-charged evaporator with connected pre-charged tubing, and a pre-charged air-cooled condensing unit for

(Continued on Back Page, Col. 1)

York Shows 1962 Cooling Products

New Air-Cooled Zone Conditioners Added

YORK, Pa.—York Div., Borg-Warner Corp.'s lines of air conditioning and refrigeration products for 1962 are currently being introduced to distributors in a series of regional business conferences.

Last of the five sessions will be staged in the Palmer House, Chicago, on Dec. 14 and .15 Other meetings were held here and in San Francisco and Dallas.

The 1962 product mix includes four lines of room air conditioners ranging in capacity from 5,700 to 23,000 Btuh, a flexible cooling and heating system for small houses and apartments, roof-top packaged units for factory and commercial applications, new air-cooled zone air conditioners, and improved automatic ice cubers and ice flakers.

York's president, Joseph B. Elliott, predicted that air conditioning industry sales for 1962 would run 5 to 10% ahead of 1961. He further predicted that manufacturers featuring quality and performance will enjoy the greatest market penetration.

He charged that the industry had only its own lack of sales effort to blame for the relatively slow rate of growth

(Continued on Page 4, Col. 1)

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Hospital Test Finds Wetted Air Conditioner Coils Remove Airborne Pollen That Air Purifiers Don't

By C. Dale Mericle

CHICAGO — "Air conditioning is very effective in removing pollen," but so-called "air purifiers" have no effect, declared Dr. Jay Spiegelman of the Albert Einstein Medical Center in discussing the role of air processing in respiratory allergies at the 48th annual convention of National Warm Air Heating & Air Conditioning Assn. here.

He was one of several speakers at a technical session that touched on quite a variety of topics, including military housing specifications, modulation of heating systems, venting, and heat loss calculations.

Dr. Spiegelman explained that he based his conclusions about air conditioning and "air purifiers" with respect to pollen control on numerous tests.

"Most 'air purifiers' produce ozone, and ozone causes a numbing of odor sensors," he said to explain how these devices operate.

Although praising electrostatic precipitators as removers of 99% of air contaminants, Dr. Spiegelman noted that air conditioning alone has proven effective in removing airborne pollen.

While conducting tests in an air conditioned hospital, it was observed that the treated air was completely free of pollen, and then it was discovered there were no air filters in the system, they having been removed for cleaning, Dr. Spiegelman said.

Apparently, the wetted surface of the coils was effectively removing all pollen, it was suggested.

Problems involved in military housing were outlined by T. R.

(Continued on Page 16, Col. 1)

Laws, In-Laws, and By-Laws

Nowadays, they say, you can't turn around without a lawyer hovering over your shoulder.

Most of us are hazily familiar only with "fundamental law," such as:

The law of diminishing returns, probably having to do with inflation.

The law of the excluded middle, which apparently has nothing to do with deflation of the human figure.

The law of Guldberg and Waage, about which the less said the better.

The law of inertia. This one every boss understands.

The law of monodromy, discovered by Alfred Lord Tennyson and converted into a long poem entitled "Maud, a Monodrame."

The law of Moses.

The law of signs.

The law of sines.

The law of the land.

The law of Avanzini which, if you are not acquainted with it or even if you are, is "the law that a falling plate encounters a resistance greatest at the center and least at the margin when it is falling vertically, and that when falling obliquely it encounters the maximum near the fore end, thus causing it to tilt up."

New laws constantly are being formulated. One law that can be observed in operation every day is Otis' Law which, in brief,

(Continued on Page 12, Col. 1)

Honeywell Appoints Binger President as Wishart Moves Up to Board Chairman

P. B. Wishart

J. H. Binger

H. W. Sweatt

S. F. Keating

MINNEAPOLIS — Paul B. Wishart, president of Minneapolis-Honeywell Regulator Co. since 1953, has been elected chairman of the board and chief executive officer, succeeding Harold W. Sweatt, who has been named chairman of the finance committee.

James H. Binger, 45-year-old vice president and director, was elected to succeed Wishart as president.

At the same time, the company's directors created a third executive vice presidency and elected Stephen F. Keating, 42, also a vice president and member of the board, to the new post.

The company's other two executive vice presidents are A. M. Wilson and Tom McDonald, both long-term members of Honeywell's top management team.

As board chairman, Wishart succeeds the man he also succeeded as president. Harold Sweatt, son of the company's founder, was president from 1934 until 1953. Now 70, he has been a member of Honeywell's top management longer than any other individual.

Binger becomes the fifth man to hold the presidency of Honeywell in its 76-year history. An executive of the company for 15 years, he has had wide experience in sales, factory production, engineering, and corporate management. Since 1956 he has had responsibility for management of Honeywell's Temperature Controls Group.

Keating, the new executive vice president, is head of Honeywell's Military Products Group.

'Egg Crating' of Modern Office Space Creates Air Conditioning Problems

By Frank J. Versagi

COLUMBUS, Ohio—The "egg crating" of modern office space may result in the loss of as much as 20% of the generous office area originally designed into a building. Further, such partitioning adds to the problems of the air conditioning engineer.

"Changing conditions of business and personnel do result in frequent changes in partitioning. So the design of the air conditioning supply outlet pattern must be such as to provide for the maximum of flexibility of partitioning change, as experience has shown that it is not possible to anticipate the whims and shapes of future partitioning," stated Ralph A. Gonzalez, Chrysler Airtemp, in his talk before the technical conference held by Region Five of the American Society of Heating, Refrigerating & Air Conditioning Engineers.

"Lights are cut in half and windows are bisected and trisected in the push and pull of office rearrangement and partitioning changes," Gonzalez complained.

'Top Filler' Seen as Status Symbol

He explained that standard partitioning goes up to a height of approximately 7-8 ft. Since most ceiling heights are 10 ft or more, the partitioning changes alone would not be so serious "if it were not for the capricious changes of the *top filler.*"

The top filler is the extra partitioning, the fills between the regular partition and the drop ceiling, to increase the privacy of the particular cubicles occupied by higher echelons of management.

"These status symbols are truly an air conditioning engineer's headache because the engineer must not only arrange to get conditioned air into the properly zoned areas regardless of present and future partitioning arrangements, but he must also arrange for getting the air out of the cubicles regardless of the additions of top filler that may occur."

"From a supply air standpoint, the answer is to space supply outlets on a modular basis, using the columns and window mullions as reference points. Without exceptions, the partitioning does generally follow the scheme of columns and glass modular pattern. So a properly spaced set of supply outlets arranged on a modular pattern and connected by the necessary ductwork for zoning purposes, takes care of the supply air arrangements.

"Now it is also true that a corresponding set of return air grilles can be connected to a similar system of ducts," Gonzalez continued. "However, such a return air system would result in a maze of ducts that would be expensive and would probably increase the attic height requirements to permit the crossover of supply and return air ductwork.

Attic Space Can Be Return Air Plenum

"By using the attic space as a return air plenum, several important economies are effected and a great deal of flexibility is achieved with reference to the future addition of top filler. The first big advantage is that a return air grille can be added anywhere in the ceiling.

"This means that partitioning and top filler can be added in any zone at any time and only a return air grille has to be added into the ceiling to let the new cubicle operate effectively. The return air grilles are particularly easy to add," Gonzalez explained, "in the perforated pan-type ceilings,

"SATISFABRICATED" BY,
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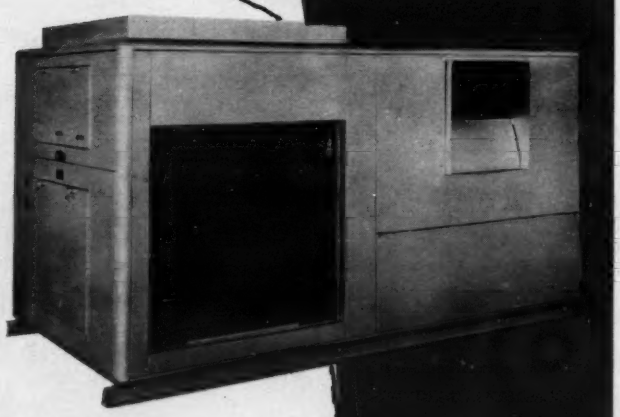
NEWEST ADDITION TO THE INDUSTRY'S LEADING SELF-CONTAINED LINE.

COMPLETELY SELF-CONTAINED
AIR COOLED
PACKAGE UNIT
TYPE SCAC



GOVERNAIR'S SCAC is available in six basic models from 10 through 40 ton capacities. Typical GOVERNAIR flexibility has been maintained with a choice of 4, 5, or 6 row cooling coils offered to meet all capacity requirements. Roof mounting has been considered in the Low-Silhouette arrangement.

The basic one-piece cooling unit is housed in a rugged weatherized cabinet and mounted on rails. It is completely wired, charged and tested at the factory. Demountable and remote arrangements are available, and accessories include choice of filters, face and by-pass dampers, reduced voltage starters, Low Ambient Control, and the Gas Fired Furnace Section.

YEAR-'ROUND AIR CONDITIONING is accomplished by the use of the gas-fired furnace section. This accessory consists of a complete and unaltered gas-fired duct furnace housed in a Weatherized Cabinet with an integral by-pass damper arrangement. Refrigerated air may completely by-pass the furnace, while any desired amount of air is diverted through the furnace during the heating cycle.

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GOVERNAIR

but are not expensive to add to any type of ceiling."

Gonzalez suggested that in addition to the elimination of return ductwork, the use of attic space as a return plenum results in the elimination of the need for insulation on the supply air ductwork, "since supply ducts run only in the air conditioned space."

Gonzalez reported that many engineers tend to shy away from the practice of eliminating the insulation on ductwork running in concealed spaces, even when these spaces are used as return air plenums and are therefore part of the air conditioned space.

"Yet these same engineers would not think of insulating the ductwork that is directly in the air conditioned space to distribute air from a packaged air conditioner located in the same space. It is frequently pointed out that ductwork in concealed spaces may sweat. This is true. Any ductwork will sweat anywhere whenever it is carrying air that is below the dewpoint of the surrounding air.

"Any such conditions can occur and do occur when equipment is improperly operated.

"For example," Gonzalez continued, "if five air conditioners with ductwork attached and running unconcealed and uninsulated are used to cool the same large sales area, sweating will not normally occur on any of the ductwork.

"But, assume that the fan on one of these units becomes reversed; then the air quantity circulated by these units will drop and the supply air temperature out of this unit can readily drop to the 45-50° range when the other units may be operating with discharge temperatures in the proximity of 60°. Under such circumstances, the ductwork carrying the colder air will sweat if the incident occurs in dewpoint weather that is well above the 50° level.

"Is the answer to such a situation the addition of insulation to the ductwork, or is it the correction of the fan rotation before the cooling coil of that unit ices up and possibly damages the compressor?" Gonzalez asked.

Dispensing with Supply Duct Insulation

For the ordinary industrial office building, he insisted, the insulation of supply air ductwork has been successfully dispensed with when the attic spaces have been used as return air plenums.

Gonzalez acknowledges that there are some differences in design procedures and equipment sizing when attic and false ceiling spaces are used as return air plenums. The return air, circulating as it does, through the attic spaces, picks up the roof heat and some of the lighting heat and brings it back to the equipment room.

"Of course, in a building designed for this type of system, the major insulation effect is put into the roof deck. A roof deck having a transmission coefficient of 0.15 is acceptable, and one having a transmission coefficient of 0.10 is better," Gonzalez said.

He estimated that with a roof deck of approximately that thermal strength, the return air temperature from the second floor attic, as compared with the return air temperature from the false space between the first and second floor "will be in the order of 6-7° warmer for the air from under the roof deck on a sunny day.

"This means that the actual second floor loads can be calculated on the basis of an attic temperature only seven degrees warmer than the room design temperature. So the actual air quantities to the second floor are slightly reduced as compared with conventional design.

"However, the mixed return air temperature to all of the equipment is increased by a higher return air temperature from the attic spaces, so that the same total load must be handled by all of the equipment."

The Airtemp spokesman stated that equipment serving installations illustrating the techniques he had described.

the first floor areas picks up some of the roof load if there is a common plenum chamber for the mixture of the first and second floor return air streams.

Another consideration is that the uninsulated supply air duct running through the return air spaces interchanges some heat with the return air. This means that "the supply air to the distant zones must be compensated either in quantity or temperature to offset the duct losses encountered in the longer runs.

"The total tonnage is calculated on the basis of air conditioning the entire area under the roof deck. This must also include the equipment room space, if this is used as a return air plenum. Then, from a tabulation of the room loads of each zone and a consideration of the mixed return air temperature, the equipment selection for each zone is a relatively simple matter," Gonzalez concluded, before showing several slides of typical

Worthington Zone Manager Sees 1962 As Banner Year for Commercial Cooling

NEW YORK CITY—A banner year for commercial air conditioning sales in 1962 was forecast by Walter Lesko, northeast zone sales manager for Worthington Corp.'s air conditioning division, at a day-long open house at the St. Moritz hotel for approximately 400 area dealers.

Dealers from New York, New Jersey, and Connecticut were feted to a continuous buffet and viewed the new 1962 line of Worthington air conditioning products.

Colorful booths featuring the new products were manned by product managers who explained the highlights of the products and answered technical questions.

Some of the products displayed included packaged heat pump, V-compressors, new G-type compressor used in packaged air conditioning units, transportation refrigeration units, and utility fans and pumps.

Dealers also got details on special 1962 plans for financing and leasing.

Lesko said he was optimistic about 1962's sales picture. He pointed out that "next year will see a carry-over of many of last year's unfinished projects, plus the expected commercial air conditioning sales surge of the coming year."

To meet this projected demand, Worthington has produced an advanced new line of air conditioning products, he said.

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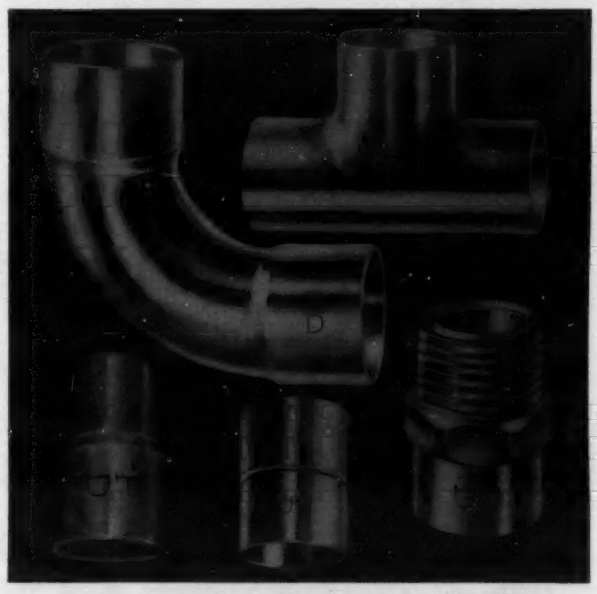
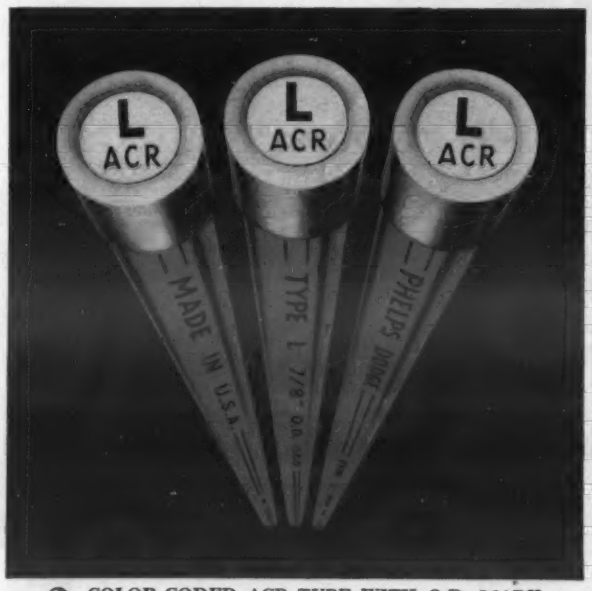
A complete line of Copper Refrigeration and ACR Tube, and Wrot Fittings from one Source!



1 NEW WROT SOLDER-TYPE FITTINGS. Phelps Dodge has added a wide range of fittings in sizes from ⅛-inch to 6 inches. All fittings are protectively packaged for factory-clean delivery.



2 COLOR-CODED ACR TUBE WITH O.D. MARKINGS. Phelps Dodge ACR tube is specially cleaned for refrigeration use. Extra-long coded end caps are your assurance of factory-clean tube at job site. Tube is color-coded for fast identification and marked with outside dimension.

3 NEW P-D PAK CARTON. Reel-type design of convenient new carton allows refrigeration tube to be rolled or paid out quickly on the job. Color-coded tape seals carton for protection, yet opens easily.

Quality tube and fittings sold the quality way—through authorized refrigeration wholesalers!

PHELPS DODGE COPPER PRODUCTS CORPORATION

New York, N.Y. • Los Angeles, Calif.

York Line--

(Continued from Page 1, Col. 5)

and low saturation.

"We feel that the entire industry has limited its growth by failing to tell properly its story of true year-round air conditioning to the American public," he said.

The new room cooler lines, in order of capacity, are the "Adventurer" (one model), "Discoverer" (six models), "Conqueror" (eight models), and "Patrician" (two models). All feature "powerful quiet" operation, "four-corner" cooling, and dual filters to cleanse both incoming and return air.

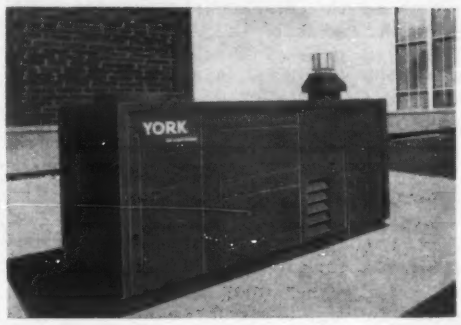
The "Adventurer," the smallest, weighs only 105 lbs and is rated at 5,700 Btu. The six "Discoverers" range from 6,500 to 9,500 Btu; one of the sextet has a heat pump.

The eight "Conquerors" range from 11,000 to 18,000 Btu, and the two "Patricians" are each 23,000 Btu and suitable for multi-room cooling.

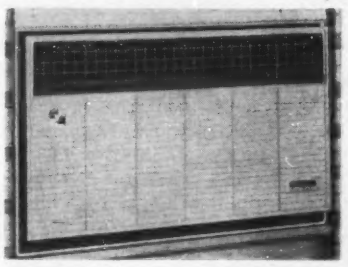
All are styled in two-tone light gray and shadow gray, highlighted by silver trim. The Adventurer and Discoverer can be mounted without tools in windows up to 60 in. wide by using the accessory "Magic Mount" kit.

York's new "Flex-O-Metic" cools, dehumidifies, filters, heats, and circulates heated or cooled air. The flexibility comes from the large number of ways in which its two basic sections—heat-exhaust section and cooling-heating section—may be arranged.

Cooling system is air cooled; installation is simplified by factory-wired controls and precharged tubing. The tubes are joined to the evaporator and condenser coils with a turn of a wrench and may be disconnected the same way without losing the refrigerant. No brazing nor field charging are involved.



LEFT: The new "Sunline" York roof-top unit for heating and cooling can be mounted on the ground as well.



RIGHT: The Patrician model room conditioner in the York line for 1962 is a heavy duty, big capacity unit for large residential or commercial applications.

The "Flex-O-Metic" will be offered in two models. Model Fa-24 is rated for nominal two-ton cooling, 23,000 Btu at ambient of 95°F; 80,000 Btu heating.

Model Fa-36 is rated for nominal three-ton cooling, 34,000 Btu, optional heating from 80,000 to 120,000 Btu. An oil furnace can be substituted, or the cooling system purchased without a furnace.

For shopping centers, motels, small factories, office buildings, and other applications of the sprawling type, the York "Sunline" will be introduced in two sizes. The "Sunline" is a package for gas heating and cooling.

The unit may be mounted upon the roof or at ground level outdoors. Model SA90G is rated for 7½-ton cooling, model SA120G for 10-ton cooling, equivalent to 90,000 and 120,000 Btu, respectively.

The gas furnace has two rows of "Silver V" burners and an economizer control valve to save fuel. The 10-ton "Sunline" has interchangeable furnace sections, which allow either 240,000 or 320,000 Btu of heating, while the smaller model has a heating capacity of 200,000 Btu.

The "Sunline" will cool efficiently at ambient temperature of 65° or below. The compressor is kept warm and in proper operating condition by thermostatically controlled strip heaters. The condensing coil is flooded with extra refrigerant. This reduces the coil area and keeps the temperature of the refrigerant in the evaporator coil above 32°.

The "Embassy" line of zone air conditioners has been augmented by a new series of air-cooled models. There are now 14 "Embassies," seven are air cooled and seven water cooled.

Capacities of the air-cooled models range from 36,000 to 360,000 Btu, roughly comparable to the range of the water-cooled models, from 40,000 to 410,000 Btu.

The new line thus gives a large selection for zone cooling and a broad range for applications ranging from a single room to a large office building.

York's automatic ice makers include three cubers and five flakers. The cubers are the first to be designed with a built-in self-cleaning cycle. Twice a day the freezing shuts off automatically, and water floods the tubes, flushing all dirt accumulations down the drain.

When the tubes are clean, the freezing restarts automatically. Besides the obvious sanitary advantages, the build-up of insulating materials on the freezing tubes is avoided, resulting in greater efficiency and less maintenance, the company said.

A selector dial permits continuous variation of the cubes from all shapes from "Thinice" wafers to chunky "King-Size" crescents. For the first time an ice crusher is available as an accessory on all models.

Model AC-20, air cooled, makes up to 250 lbs of ice a day. Model WC-20, water cooled, makes up to 255 lbs of ice a day, and model WC-40 also water cooled, up to 500 lbs.

In both cubers and flakers, the ice is frozen from cascading water, eliminating the air bubbles and insolubles that give ice a cloudy appearance. The five York ice flakers have capacities ranging from 300 lbs up to 4 tons of ice a day. The largest, the remote water-cooled model DER-25F, takes up only 12.8 sq ft of floor space.

Elliott pledged his distributors that York's plans are directed toward quality products with strong advertising support, informing the public of the true performance of its products.

Leaves more useful shelf space available in reach-ins, back bars, and under-counter cabinets because it has an *extremely flat, thin silhouette of only 4½".*

OTHER TOP-AIRE FEATURES ARE:

- **Angled fitting so drain can be run through back or bottom of cabinet**
- **Knockouts in top, plus opening in rear, for bringing out connections**
- **Adequate space inside cabinet for expansion valve to be attached . . . out of sight**
- **Life-lubricated, impedance-protected motor**
- **Attractive grained aluminum cabinet.**

Available in four capacities: 1000, 1300, 1700, and 3000 BTU/hr at 10° T. D. based on entering air temperatures. For complete information, write for Bulletin No. 81 or call your Bohn Wholesaler.

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ASHRAE Introduces New Psychrometric Chart

NEW YORK CITY—A new psychrometric chart, the result of 50 years of analysis and study, was presented recently by the American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE) at the co-sponsored meeting between this society and the American Society of Mechanical Engineers (ASME) at the Statler Hilton hotel.

The new chart shows the degee of moist or dry air as determined from the properties of temperature, heat content, moisture content, and air volume.

"The chart is invaluable to engineers in solving the problems inherent in ascertaining the amount of humidity and temperature to be given to air for human comfort," ASHRAE said.

Features of New Chart

Presented by ASHRAE President John Everetts, Jr., the new chart is designed to replace the previous charts adopted by ASHRAE's predecessor societies. The new psychrometric development is basically an enthalpy-humidity ratio chart on which factors such a dry bulb, wet bulb, dewpoint, and volume information are evident.

"Evolved by ASHRAE's Psychrometric Panel, the chart uses as a coordinate system enthalpy and humidity ratio, thus a mixture is on the straight line joining the two individual state points," it was explained. "The wet-bulb lines are straight lines and the dry-bulb lines are nearly straight lines but spreading out toward the top of the chart.

"Since a normal starting point for the solving of problems uses the dry bulb and wet bulb, these functions together with relative humidity and humidity ratio are shown as a complete grid of lines.

"In the interest of keeping the chart 'clean,' a skeleton grid of enthalpy lines has been shown in the working area of the chart, but to provide a working tool, complete scales of enthalpy are shown at both ends of the working space, thus making it possible to locate the enthalpy accurately for any state point by the use of a ruler or straight-edge.

"Approximate values of enthalpy can be found by reading the enthalpy corresponding to the wet bulb at saturation. By adding the negative enthalpy deviation for the wet bulb and humidity ratio of the state point, the correct value of enthalpy can be obtained.

"Alternatively, the value of enthalpy for the given wet bulb at zero humidity can be read at the bottom of the main chart and corrected by adding the enthalpy of water shown on small chart at left.

"The chart is also essential in solving problems in manufacturing processes including the addition or removal of moisture from the manufactured products."

Everetts, a member of the consulting engineering firm of Charles S. Leopold, Inc., Philadelphia, presented, at a luncheon on Nov. 28, a scroll to Cloud Wampler, chairman of the board and chief executive officer, Carrier Corp., commemorating the 50th anniversary of Dr. Willis H. Carrier's publication of "Rational Psychrometric Formulae."

In the evening, Everetts attended the meeting of the Div. of Oceanography and Meteorology of the New York Academy of Sciences to explain the design of the controlled-climate chamber for study of the effects of meterological changes on human diseases.

Designed by Everetts' firm, the chamber will maintain any temperature from 65° to 20°F, with a minimum of 40° dewpoint, a maximum of 80% relative humidity up to 75 wet bulb and a limit of 75 wet bulb.

The chamber will be utilized by the rehabilitation center of the Hospital of the University of Pennsylvania for arthritic patients. It reportedly is the only laboratory of its type where two patients may live for an extended period of time without leaving the chamber. The experiments to date have included patients in the room for as long as four weeks.

Also that evening, Everetts was present at the monthly meeting of ASHRAE's New York Chapter to extend to Crosby Field, former vice president and director of Brillo Mfg. Co., Inc., an honorary membership in ASHRAE.

Field will be the only member of this society ever to be accorded this honor. Other honorary members of ASHRAE are the Honorable Herbert Hoover, former President of the United States, Dr. Milton Eisenhower, and Arno C. Fieldner.

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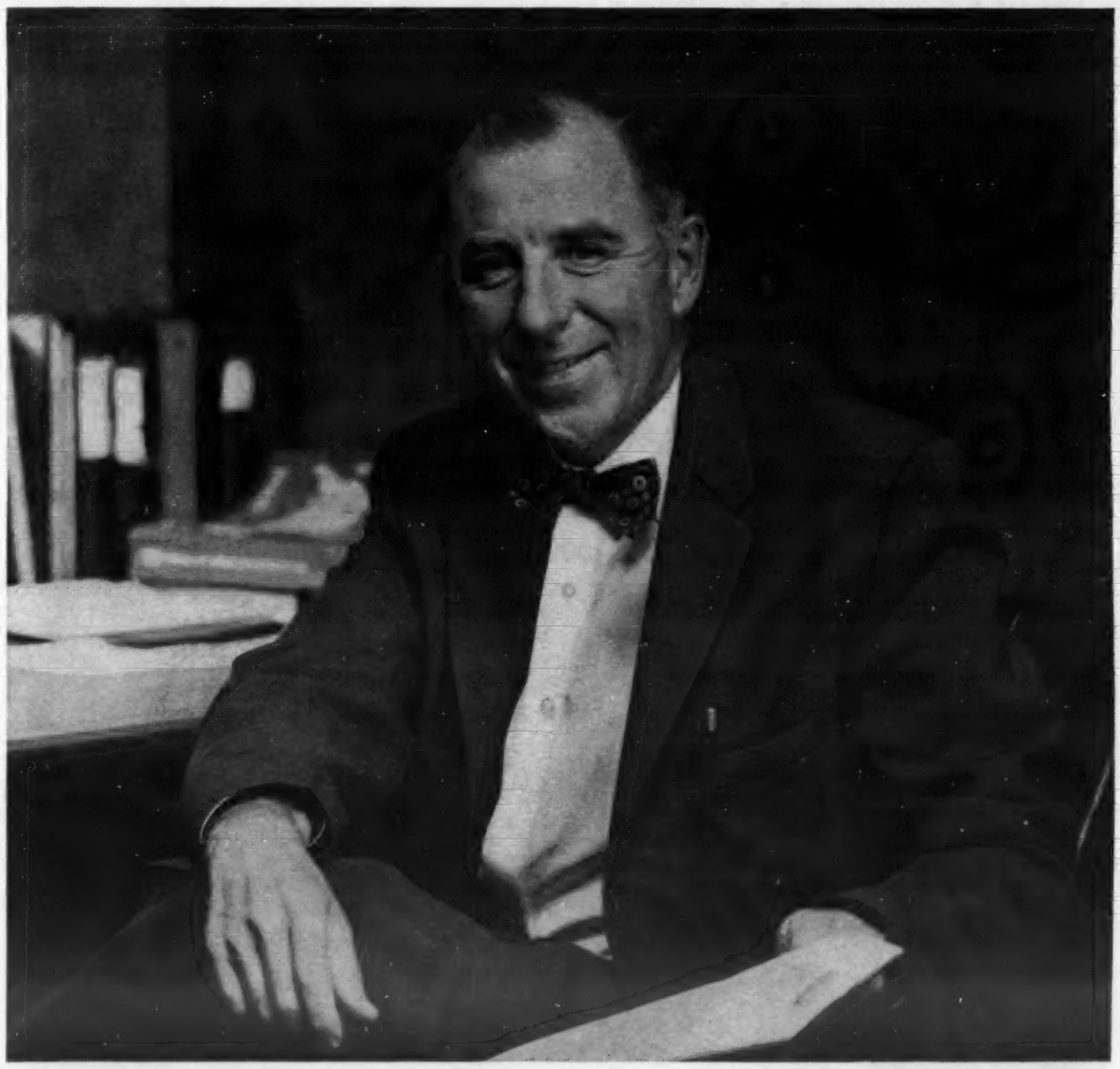
BHC Meeting Set For Dec. 18-19 In New York City

NEW YORK CITY—The 6th annual meeting of the national Better Heating-Cooling Council will be held Dec. 18 and 19 at the Hotel Delmonico here.

Local council operations will be discussed Monday morning, Dec. 18, starting at 9:30 a.m. Following a luncheon, plans and operations of the Commercial & Industrial Div. will be covered. A dinner and talks by guest speakers are scheduled for Monday evening.

Tuesday's program includes the president's address and executive director's report in the morning, noon luncheon, and a discussion of the Residential Div.'s plans and operations in the afternoon.

Other features of the meeting will be a presentation on Monday on "How To Short Circuit Your Electrical Competition" and, on Tuesday, a special report on the remodeling market and a panel discussion on successful use of BHC's new wholesaler manual.



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Advantages of Utility-Supplied Heating And Cooling Outlined for Engineers

By Frank J. Versagi

COLUMBUS, Ohio—The advantages of utility-supplied heating and cooling were summarized for engineers attending the annual technical conference of Region Five of the American Society of Heating, Refrigerating & Air Conditioning Engineers recently.

A. R. McKinney, Christian Schwarzenberg & Gaede Co., Cleveland, a civil engineer, was chosen to make the presentation because—as a civil engineer—he would have no bias for or against the concept of utility-supplied heating and cooling, the NEWS was told.

McKinney introduced his discussion by pointing out that he had drawn upon the independent knowledge of a gas utility, a mechanical contractor, and a consulting engineer.

"We must face the fact that as large tonnage cooling equipment becomes more and more complex, plant personnel whose responsibility it is to operate and maintain such equipment falls farther and farther behind in knowledgeability; the result is an increasing lack of reliability," opened McKinney.

Wherever possible, water is supplied by a public utility; sewage is taken care of in the same way; electricity is no longer generated by individual users; is there any logical reason why cooling cannot follow the history of these and of district heating? McKinney asked.

"It is indisputable, I believe," he said, "that large central station equipment costs less per ton than the same capacity equipment set in several plants in several locations. This same cost savings applies to auxiliaries used on such central equipment. It is possible to have stand-by equipment at a central station, but the air conditioning industry has been notoriously unable to sell present users on the concept of stand-by refrigeration equipment. Stand-by boilers, si; stand-by cooling, no."

McKinney stated that less floor space is required when cooling is centrally supplied to an industrial or commercial complex. When you consider that space leases for about $8.50 per square foot per year, you can see the savings all around from this, he said.

"Fuel costs will be lower by the simple fact of large buying power of such a central supplier."

Distribution Seen As Major Disadvantage

McKinney acknowledged that although all of the advantages of utility-supplied cooling are obvious when one considers the central station concept, all of the disadvantages lie in distribution. "As is true in all utility-supplied functions, distribution is all overhead."

Therefore, the need is for a large load in a very small area before centrally supplied cooling can be considered feasible. Too, the utility can make use of the least expensive or least desirable land for the central plant in the complex.

"The ultimate question, of course, is — can the customer buy Btu or Btu removal at a lower cost than he could arrange for himself?"

Project Considered In Cleveland

In Cleveland, thought is being given to an experiment in utility-supplied cooling. The development has the tentative name *Erieview Project*. According to McKinney, the cooling requirements of this project would call for 25,000 tons of installed air conditioning; heating requirements are 200,000 lbs of steam. In obtaining cost data for making these comparisons, McKinney checked with a contractor and asked him to give prices for equipment, totally installed, in several size ranges.

Per tonnage costs were these: $217 per ton for a 50-ton installation, reciprocating; $241 per ton for a 100-ton installation, centrifugal; continuing with centrifugal equipment, $157 per ton for a 300-ton installation; $146 per ton at 600 tons; $132 per ton at 1,000 tons; and $90 per ton at 10,000 tons.

Constitution Plaza Project Cited

McKinney alluded to Constitution Plaza, the central cooling experiement being conducted in Hartford, Conn. According to McKinney, Constitution Plaza calls for 6,500 tons of air conditioning, and 150,000 lbs of steam and is costing about $3,000,000 for the heating-cooling equipment.

Using Hartford - announced rates, McKinney calculated that 100 tons of air conditioning would cost an individual owner $2,600 a year for fuel only; 2,000 lbs of steam for a year would cost the owner $3,000 for fuel only. These same functions, supplied from the central plant, will cost the user $4,500 for heating and $6,000 for cooling.

The difference between this latter total of $10,500 and the former total of $5,600 might be considered a saving. However, McKinney explained, an owner would have to spend $36,100 to set up the boiler and chiller arrangement needed to supply his own heating and cooling; thus it would take some seven years to pay for the equipment on the basis of fuel cost savings alone. This does not take into consideration interest, maintenance, and other costs which would stretch the time to 10 years, he said.

Running the same sort of comparison for a 1,000 tons of cooling and 20,000 lbs of steam, McKinney came up with a $50,000 annual fuel cost for owner - supplied heating and cooling, compared to $95,000 for centrally-supplied heating and cooling.

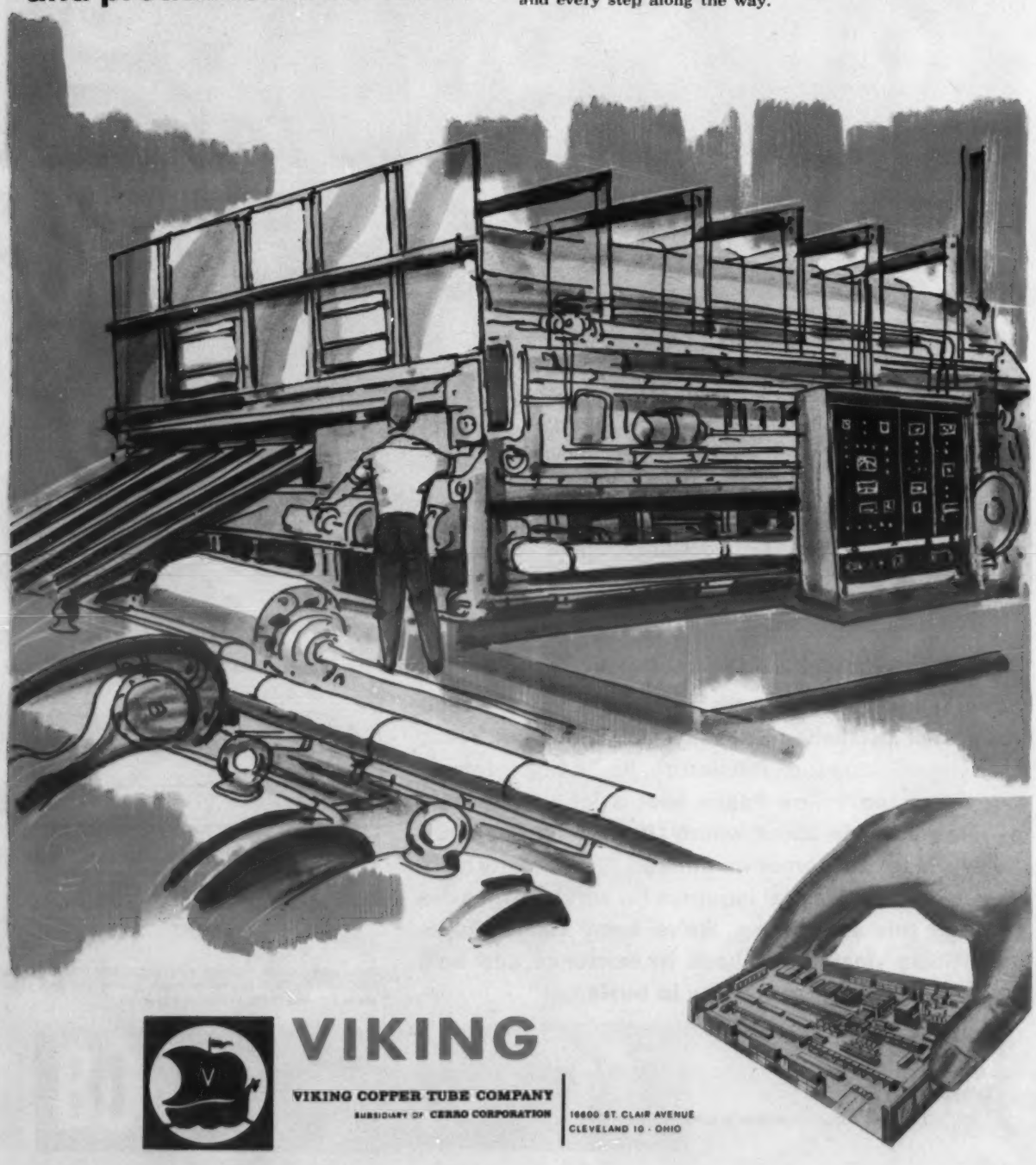
In this instance, however, the necessary equipment installed on the owner's premises, would cost $212,360.

"As in so many other things," McKinney cited, "there are advantages which are not necessarily measured financially; I would list among these the fact that no cooling tower is necessary on an otherwise beautiful building; noise is reduced or non-existent; inability to get service, which is always a major problem for the user-owner, becomes less significant a factor." McKinney stressed that in his

. . . putting the heat on takes the pressure off and produces better tube!

Viking's new primary mill was planned and dedicated to the premise that the more rigidly controlled the production of tube is at the beginning . . . the better quality it will be at the end.

Thus, Viking engineers designed the furnaces in this new plant to heat the entire billet to that precise degree of temperature which permits precision piercing. Absolute uniformity is an assured quality of Viking copper tube in its "end use" because of its careful, precise production in the initial stages . . . and every step along the way.



VIKING

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opinion this inability to get service when it is needed on large tonnage equipment, is causing increasing dissatisfaction among user-owners.

For the sake of discussion, McKinney pointed out that 10,000 tons of cooling would probably require a 24 to 30-in. chilled water pipe using a 15°F temperature drop. Steam to supply heat for the same complex would take a 12-in. supply and a 5-in. condensate return.

Use of Brine Suggested

Members of the audience questioned that it would be feasible to supply cooling with water so near to utilization temperature; it was suggested that brine be used in place of water.

McKinney rebutted that using large enough diameter supply means would obviate the need for lower supply temperatures. He stated that the use of glycols or other type brines would increase the refrigeration requirements and drastically alter the economic feasibility of utility-supplied cooling.

As it stands, consensus seems to be that two or three miles of total piping is a limit for the first experimental projects.

Over the objection of several electrical utility members in the audience, McKinney cited data which seems to indicate that absorption air conditioning would be most economically feasible for utility-supplied cooling and heating.

Engineering Preview Gives Students a Look at Heating-Cooling

SAN LUIS OBISPO, Calif.—A select group of 36 high school scholars will spend three days of their Christmas vacation at California State Polytechnic college here Dec. 17-19, taking part in the second annual Engineering Preview.

Designed to give high school juniors and seniors a brief survey of some of the many subject areas in engineering, the industry-sponsored Preview's objective is to provide the young scholars with a basis for understanding the nature of engineering as a career.

Major emphasis in this year's program will be given to heat energy and transfer systems, with secondary emphasis on computers.

"Approximately 500 students from 250 California high schools applied for the program, making final selection highly competitive and extremely difficult," Dean of Engineering Harold P. Hayes said.

As sponsors of the Preview, Western Air Conditioning Industries Assn. will finance the transportation, board and room for the 36 successful applicants.

At its own request, the association will have no active part in planning and conducting the program except that association Vice President Arthur Hess will speak at one session on the air conditioning and refrigeration engineer's role in space programs.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Ranco Moves Research Facilities

COLUMBUS, Ohio — Ranco, Inc. has announced that its research activities, formerly located in Pompano Beach, Fla., have now been completely transformed to enlarged research and engineering facilities in Columbus.

Joseph E. Kumler, vice president, research and engineering, said the move was made to centralize research and development work with the main engineering operation at corporate headquarters in Columbus. He emphasized the move was necessitated by Ranco's intensified research and development program which required closer liaison with other divisions of the company, located in Ohio.

Kumler gave these facts about the recent move and plans for Ranco's research and development program:

Positions in Columbus were offered to engineers and technicians in Florida and several are now located in Columbus; several thousand square feet and additional personnel have been added to the total engineering facility; new areas of research are being added; separate facilities have been provided for research, development, and production engineering.

In conjunction with one of the new areas being studied, the enlarged research and development operation includes an electronics laboratory. New and enlarged test facilities will provide for greater research and development on refrigeration and air conditioning devices.

The research operation is directed by S. F. Ciricillo, who was with the Ranco research facility at Pompano Beach.

Wins Golf Craft Clubs at Canadian Meeting

J. R. ALVAREZ of Canadian Tyler Refrigeration Ltd. was the winner of the Golf Craft clubs given away at the recent Canadian Refrigeration & Air Conditioning Association show in Toronto. Shown at the drawing are: Don W. Graham, Vampco Aluminum Products Ltd.; W. "Bill" Marshall, chairman of the show; and W. "Jim" Grieve, Vampco. The aluminum firm sponsored the drawing.

Baldwin-Ehret-Hill Moves Midwest Offices

CHICAGO—Midwest division offices of Baldwin-Ehret-Hill, Inc., manufacturer of industrial insulation, building, and acoustical products, have been moved from 600 S. Michigan Ave. to 35 E. Wacker Dr. (Pure Oil building) here.

In addition to M. G. Jensen, midwest division manager, the new offices will be headquarters for Ernest E. Drake and Carl W. Burgeson, district managers, as well as other midwest division sales staff members, it was announced.

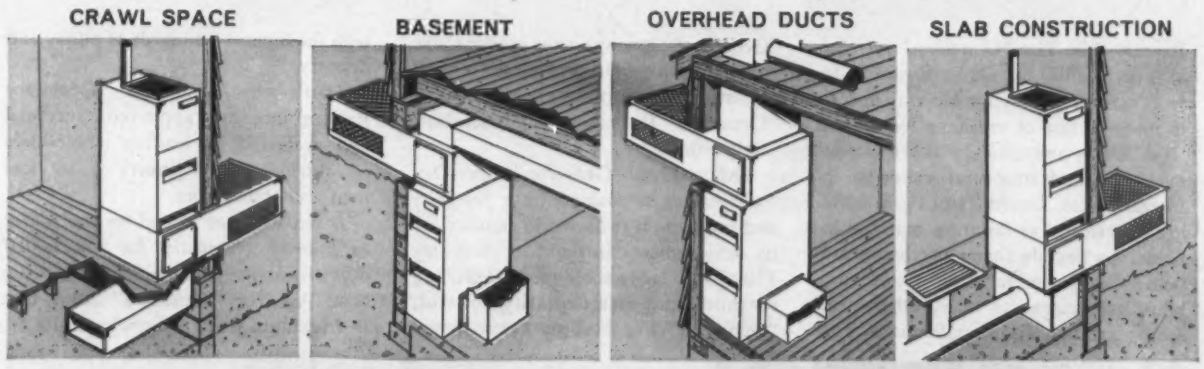
NEW GM-DELCO THRIFT-PAK

OPENS THE MARKET FOR LOW-COST HOME CONDITIONING

GM-Delco's new thru-the-wall heating and cooling system now brings the vast $10,000 to $15,000 range of homes into the air conditioning market. In fact, *Thrift-Pak* was specifically designed to make it practical to install year-round air conditioning in these modestly priced homes. Low installation cost makes this possible. In just sixty minutes, two men can install this new GM-Delco Conditionair. For more information, write the Delco Appliance Division, Dept. R-7, General Motors Corporation, Rochester 1, New York.

THRIFT-PAK
(upflow or counterflow models)
gives complete heating and
air conditioning

Versatile - 4 practical applications



GM Delco 365 CONDITIONAIR

DELCO APPLIANCE DIVISION • GENERAL MOTORS CORPORATION • ROCHESTER, NEW YORK

Try Thermoelectric Safety Control On Gas Refrigerator

DALLAS — A thermoelectric control reportedly used on a refrigerator for the first time was demonstrated during the annual convention of the American Gas Association here.

In the control, a thermoelectric element is heated by the pilot flame of the refrigerator burner. This element generates an electric current which goes to a Baso automatic pilot valve, holding open the valve as long as the flame is burning. If the flame is extinguished, the flow of current ceases and the valve closes without delay for cooling, explained engineers.

Utilized in a new Norge gas refrigerator (model 714-980, "Never-Frost"), the control was developed in cooperation with with Baso Div. of Penn Controls, Inc., Milwaukee.

In a special statement the engineers said:

"The thermoelectric sensing element is held firmly in place by a sleeved screw, assuring a constant and permanent location.

"The flow of gas is controlled thermostatically in response to the demand of the refrigerator load by means of a specially-developed 110-volt Basotrol bipolar magnetic valve. The sensing element of the thermostat located within the refrigerator air stream opens or closes a pair of electrical contacts. This circuit, in turn, controls the valve.

"The end result of this thermoelectric device controlling the valve over the flow of gas results in a 100% safety factor and greater probability for a service-free installation."

Sheet Metal Workers Union Ousts United Steelworkers at Carrier

SYRACUSE, N. Y.—Climaxing a long-standing jurisdictional battle between two AFL-CIO unions—the United Steelworkers Union and the Sheet Metal Workers Union, production and maintenance workers at two local plants of Carrier Corp. voted for the latter as collective bargaining agent by a margin of 2 to 1.

The employes have worked without a contract since January, 1960, when the Steelworkers won bargaining rights. In the recent election, they voted for the Sheet Metal Workers despite the fact that the AFL-CIO Executive Committee last June ordered the union to cease its organizing campaign at Carrier.

A National Labor Relations Board field examiner said the election outcome was as follows: for representation by the Sheet Metal Workers, 1,721; by the Steelworkers, 864, by neither union, 35. Six ballots were voided and 301 challenged.

Joseph P. Molony, district director of the Steelworkers, termed the election result "a black day for the American trade union movement." But to Edward J. Carlough, director of organization for the Sheet Metal Workers, it was "a victory for basic trade union principles."

In Springfield, Ill., an international organizer for the Sheet Metal Workers, upon his return from the election site, in Syracuse, was quoted as saying that the Midwest immediately will experience the extension of the union's influence in the air conditioning industry.

The organizer, Frank Scaduto, added that the "effect of this election will eventually be felt through this country and Canada. This is the biggest plant in which our union has won such an overwhelming victory."

Scaduto said that while various union officials have issued statements favoring one union or the other, "the air conditioning industry will remain an open field for both unions. But the Carrier election now favors the Sheet Metal Workers Union, who have always maintained they have jurisdiction over this field."

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Industrial, Craft Unions Battle on Job Rights Issue

MIAMI BEACH, Fla. — The question of whether industrial or craft unions should be awarded job rights in maintenance work was expected to spark a full-scale battle between the two types of unions at the AFL-CIO convention staged here over the past weekend.

Before the convention opened, Walter Reuther, head of the industrial division and a vice president of the AFL-CIO, had attacked the craft unions for fostering the disputes and had proposed a system of court-enforced arbitration to settle the question. He had asserted that the convention cannot adjourn until it found an answer to the jurisdictional problem.

George Meany, AFL-CIO president, had turned aside Reuther's argument by calling this dispute a political clash among rival union leaders. The building trades department indicated a willingness to settle the problem, but not on Reuther's terms.

U. S. Labor Secretary Arthur Goldberg warned the AFL-CIO that this dispute should "not be one whose remedy is disunity" and indicated that its settlement is in the national interest.

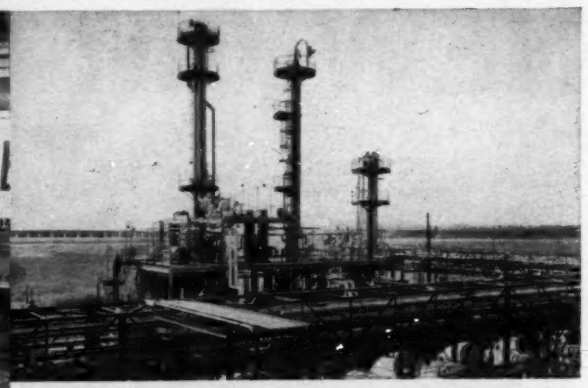
Westinghouse Opens 'Home Center' Display

PITTSBURGH — A new "Westinghouse Pittsburgh Home Center," designed to display for the first time in one central location the complete line of Westinghouse products for the home, has been opened here.

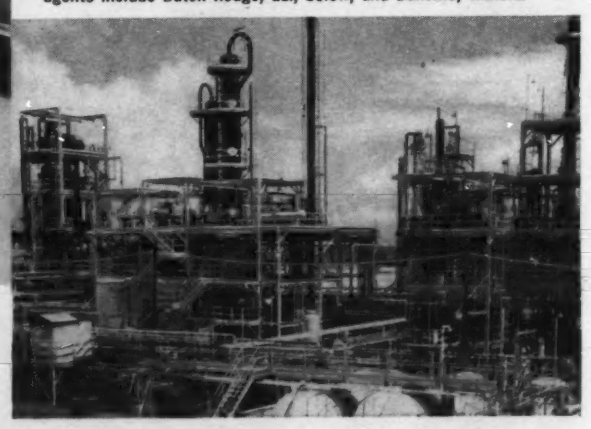
The center is operated in conjunction with the Pittsburgh headquarters of Westinghouse Appliance Sales at 5550 Centre Ave. where the former major appliance display room has been completely remodeled into seven different fully furnished room settings.

A sampling of the complete line of products that Westinghouse makes for the home is on display, including furnaces, air purifiers and humidifiers, and central air conditioning units, and Bryant wiring devices and load centers.

In refrigerators and freezers "Genetron"-blown urethane foams offer vastly superior insulating performance . . . as much as 2 times the insulating value of CO_2-blown foam and 2½ times the effectiveness of glass wool batting. With "Genetron"-blown urethane, storage capacity of refrigerators and freezers can be increased on the order of 20% without increasing outside dimensions.



Here at Elizabeth, N. J., General Chemical has large new facilities where it applies the most advanced manufacturing techniques to produce "Genetron" Super-Dry Refrigerants and "Genetron" blowing agents for flexible and rigid urethane foams. **Other production facilities** for "Genetron" Super-Dry Refrigerants and urethane foam-blowing agents include Baton Rouge, La., below, and Danville, Illinois.



What does freezer insulation have to do with genetron® super-dry refrigerants?

Exactly this. The "Genetron" refrigerants so familiar to you have proved to be remarkably superior blowing agents in manufacture of urethane foams. As rigid foam, urethanes make superior insulating and structural materials in freezer boxes, "reefer" trucks, in building panels and as flotation material in boats. As flexible foam, urethanes are being widely used in furniture, automobiles, mattresses and many other cushioning and insulation applications. The "Genetron" blowing agents used in these new foams are a direct result of General Chemical development work with "Genetron" fluorinated hydrocarbon refrigerants.

The quality of "Genetron" Super-Dry Refrigerants is assured by a research and production team world-famous for its achievements in fluorine chemistry. Thanks to advanced manufacturing methods and strict quality control, "Genetron" has become synonymous with the highest standards of purity and dryness.

That's why "Genetron" Super-Dry Refrigerants are approved, accepted and preferred by leading wholesalers . . . refrigerating engineers . . . servicemen and contractors.

It makes sense to call on the leader in fluorine chemistry for fluorinated hydrocarbon refrigerants. Insist on the best! Ask for "Genetron" Super-Dry Refrigerants from your wholesaler.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Look to the leader in fluorine chemistry . . . insist on "Genetron"!

Duct Combines Insulation, Vapor Barrier, Acoustic Liner

TOLEDO—A new "Fiberglas" duct system which combines air duct, thermal insulation, acoustical liner, and a vapor barrier in one product for residential and commercial heating and air conditioning has been announced by Owens-Corning Fiberglas Corp.

"The new duct system, the result of several years of research and field testing, can be installed faster than conventionally insulated or lined sheet metal ducts," the company stated. "It is available in preformed rectangular and round forms as well as flat boards, which can be fabricated into duct components.

MODEL DEMONSTRATES light weight of new Fiberglas Duct System designed for residential and commercial heating and air conditioning applications. Inset photograph shows how the preformed and preinsulated rectangular ducts, which are packed flat for shipment, spring back to their original form when removed from the carton.

PACKAGED FLAT FOR SHIPMENT

"The pre-formed and preinsulated rectangular ducts, which are packed flat for shipment, spring back to their original rectangular form when removed from the carton. The only work required at the job site is the joining of the duct sections, which is accomplished by use of a new interlocked joint and special tape. No metal connectors are needed for most duct sizes.

"The large flat boards are designed for commercial or residential duct systems where a wide range of rectangular duct sizes is required.

"The new duct system consists of high density Fiberglas thermal and acoustical insulation with a flame retardant, puncture-resistant vapor barrier jacket.

"On the residential line the vapor barrier jacket is a special laminate of embossed kraft paper and aluminum foil reinforced with Fiberglas yarns; the commercial line utilizes a similar laminate with an easily cleaned vinyl surface."

The system is said to be competitive in price with most insulated metal duct systems.

According to Owens-Corning, the new duct system is more efficient than the same thickness of light density flexible insulation wrap. The new product "effectively absorbs blower noise and eliminates voice transmission and duct vibration," the company said. "The factory installed vapor barrier, an integral part of the product, eliminates condensation worries.

"The system which can be used at temperatures up to 250°F and to a velocity of 1,500 fpm has been approved by Underwriters' Laboratories as an air duct material for residential and commercial warm or cold air distribution. It meets National Bureau of Fire Underwriters Standard 90B for residences and Standard 90A for commercial installations."

The rectangular ducts are manufactured in 4-ft lengths and in a 1-in. thickness with inside dimensions ranging from 8 by 8 in. to 24 by 8 in.

Round ducts are available in 6-ft lengths with inside diameters from 4 to 18 in. in thicknessess of ¾ to 1 in.

The flat duct boards are available in thicknesses of 1, 1½, and 2 in. in 48-in. width from 24 in. to 120 in. long.

Gering Plastics Named National Sales Agent For Cellulite Board

KENILWORTH, N. J.—Gering Plastics here, division of Studebaker-Packard Corp., announced that it is now national sales agent for "Cellulite" expanded polystyrene.

Cellulite board is produced in standard and self-extinguishing types for such uses as perimeter insulation, plaster base, backer board for shingles and aluminum siding, cavity wall insulation, roof insulation, and low temperature insulation for refrigerator floors, walls, and ceilings.

The expanded board complements Gering's "Ger-Pak" polyethylene sheeting which is used by the building trade as a water vapor barrier.

Cellulite board is said to have exceptionally light density (1 lb/cu ft). Cellulite is chemical and fungus resistant. Water absorption is "extremely low." "K" value at 40°F is 0.238.

Standard dimensions of Cellulite expanded polystyrene board range in width from 12 in. to 50 in.; in length from 4 ft to 12 ft 4 in. in 2-ft increments. There are two ranges of thicknesses: from ½ in. to 8 in. in ¼-in. increments; from 10 in. to 20 in. in 2-in. increments. Nonstandard sizes are obtainable on special order.

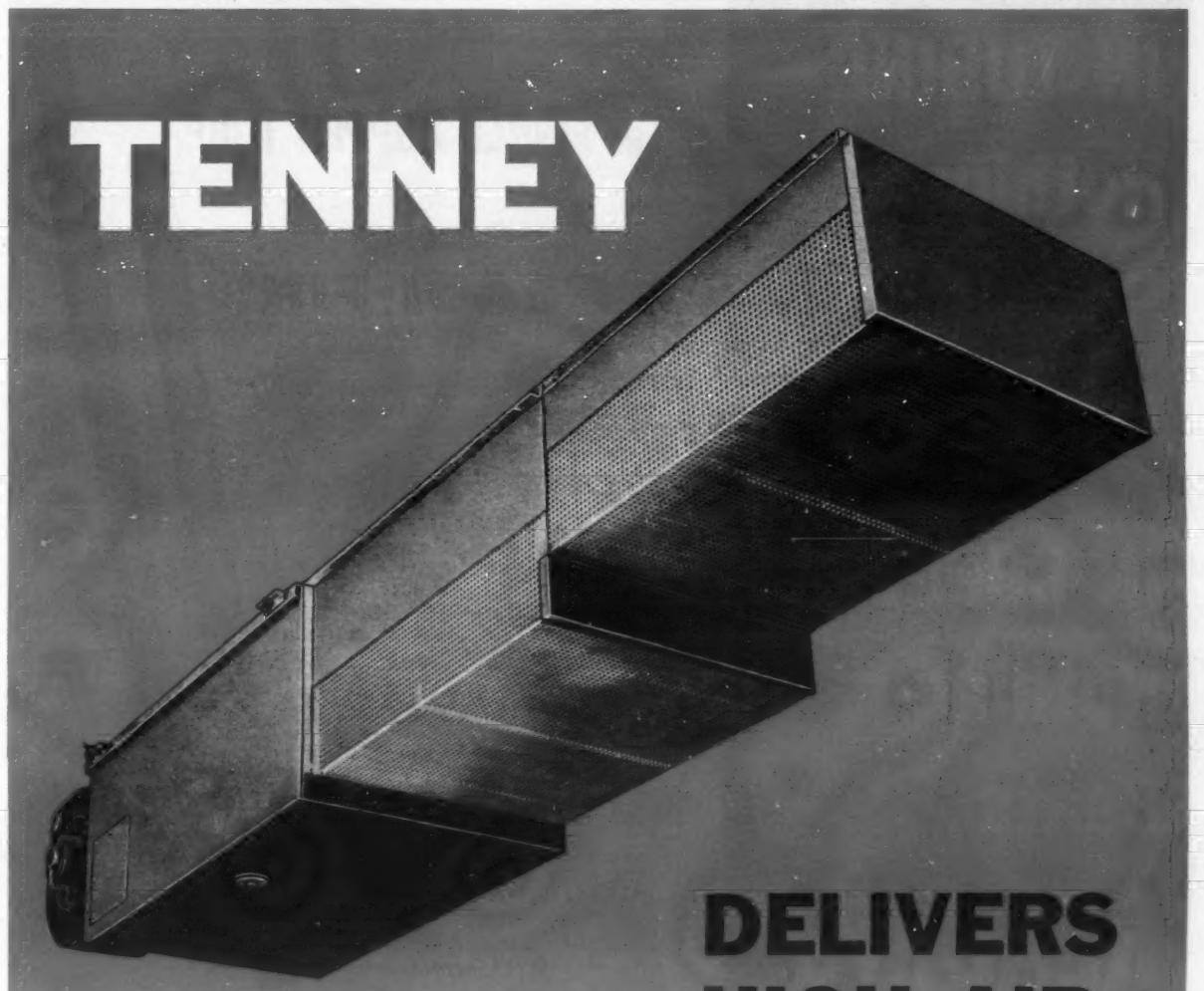
LUCAS CAP. TUBE CLEANER $19.65

Clears all Cap. Tube Obstructions in jig time.

AT YOUR FAVORITE WHOLESALERS OR

Southgate Tool & Die Co.,
P. O. Box B-1097, Southgate, Mich.

TENNEY



DELIVERS HIGH AIR VOLUME AT LOW VELOCITY

Tenney LV Unit
A Deluxe Package

Obtaining low velocity is easy, obtaining high air volume is simple, but combining them into one deluxe package is an achievement. This step forward in evaporator design combines the low air velocity of a coil and pan arrangement with the positive air circulation of a blower. LV offers a new standard of performance for meat and prepack rooms, for florist storage boxes — for any refrigerated enclosure where a premium is set on saleability of product and comfortable working conditions.

Write today for complete information on the new Tenney LV.

Refrigeration, Heating & Air Conditioning Products Division

Tenney ENGINEERING, INC.

1090 SPRINGFIELD ROAD • UNION, NEW JERSEY

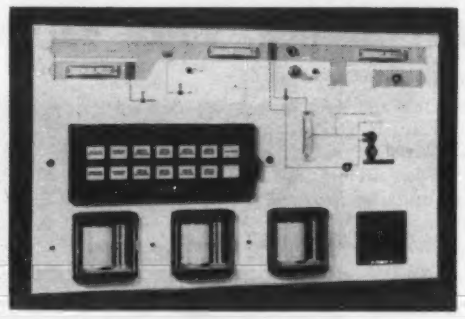
Automated Check Handling System Requires Positive, Reliable Temperature, Humidity Control

A VIEW of the First Wisconsin National Bank's new fully expandable automated check processing system currently geared to handle approximately 500,000 checks a day. The 8,000-sq ft glass-enclosed area that houses the various high-speed machines requires positive and reliable air conditioning to maintain the accuracy of the machines and dissipate the heat they generate.

MILWAUKEE — Installation of a new $1.5 million automated check handling system by the First Wisconsin National Bank of Milwaukee has called for an air conditioning system that provides reliable and positive control of both temperature and humidity.

The electronic data processing system is capable of processing 400,000 to 500,000 checks a day at the rate of 2,400 per minute. Several of the high speed components generate substantial amounts of heat which must be rapidly dissipated to protect the components and the accuracy of the processing.

To maintain the 8,000-sq ft glass-enclosed area at a design condition of 75°F and 50% r.h., the Thomas E. Hoye Heating Co. of Milwaukee designed and installed a high pressure double duct distribution system connected with a Vilter UF-6 R-22 "Uni-Chiller."



PANEL BOARD shows schematic representation of the air conditioning system and contains recorders, thermometers, and alarm lights that maintain close control.

Electronic equipment installed includes a computer, six high-speed magnetic tape machines, a high speed printer, a "multiplex" control, and printer control panels. At present, two high-speed document sorters and 20 check encoders have been leased temporarily from other manufacturers. They will be replaced when the bank's permanent equipment is finished.

Eventually the system will include another computer, four sorters, 60 encoders, another high-speed printer, and 200 tapes. Space is also available for a third complete system.

Temperature and relative humidity ranges permissible vary with the different pieces of equipment. Machines with the most critical tolerances are the document sorters. The air conditioning was designed for them.

The Uni-Chiller has a capacity of 61.8 tons with 55° entering water and 45° leaving water. An air-cooled condenser is mounted on the bank's roof.

Evaporators for the system are cooling coils mounted in a plenum chamber with air distributed into the conditioned area through the slotted acoustical tile ceiling. This type of distribution results in imperceptible movement of air for the maximum comfort of personnel in the room. Return air is taken through the machines and into the floor. The machines have no fans and this is the only means of cooling them.

Fresh air is filtered both before and after it passes through the cooling coils. The pre-filter system is 35% efficient and the filter system has an efficiency of 85%. A pan type humidifier is installed after the coils to insure the maintenance of the desired humidity level.

Because of the importance of exacting control of the climate, a panel board is prominently mounted right in the conditioned area. In addition to a schematic presentation of the system, the board contains recorders, thermometers, and alarm lights.

The recorders trace the tem-

IN TUBING—
Nothing
Beats
Copper!

IN COPPER—
Nothing
Beats
READING!

For FINNED COPPER TUBE
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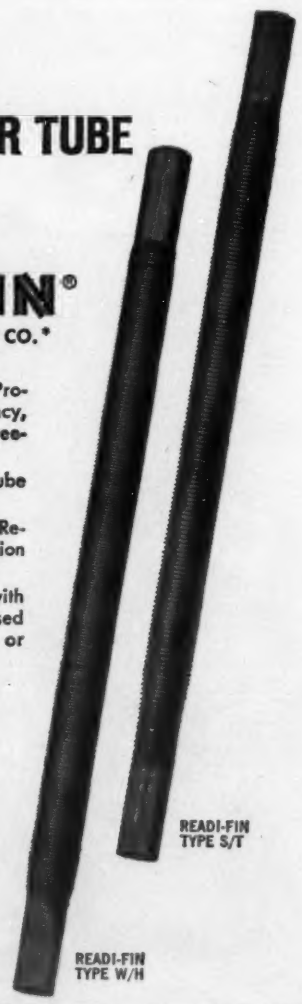

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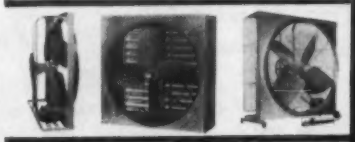

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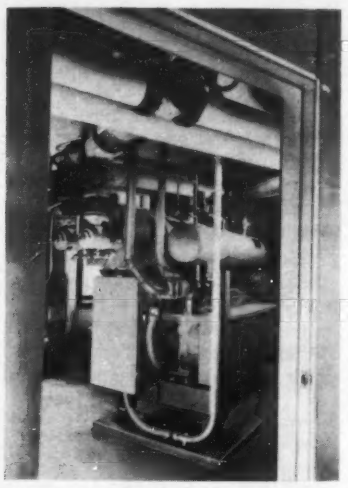

VILTER "Uni-Chiller" has a capacity of 61.8 tons, reducing cooling water from 55 to 45°F. As a precaution, the chiller is cross connected with the chilled water system of the building so that desired temperature and humidity can always be maintained.

perature and humidity levels of three separate areas that are conditioned; the computer, sorter, and printer rooms.

The thermometers show the temperature of the entering fresh air, the air after passing through the cooling coils, and the hot deck air after it has traveled through a reheat coil. Another thermometer gives temperature of the water leaving the chiller.

Four alarm lights are mounted on the panel for each of the three separate areas. Either a high temperature or low temperature, high humidity or low humidity condition will cause the appropriate light to light and a warning horn to sound, both in the conditioned area and also in the building superintendent's office.

The building superintendent will then immediately send an engineer to acknowledge the alarm and take the necessary corrective action. Lights on the panel board will also signal when the system's filters require changing.

As a further precautionary measure, the Vilter chiller has been cross connected with the chilled water system of the building so that, if the chiller had to be down for any period of time, the desired temperature and humidity levels could still be maintained, it was pointed out.

180 Tons of Cooling Used In Shopping Center and Mall

PHOENIX, Ariz. — The new $20 million Chris-Town Shopping Center in northwest Phoenix, built by Del Webb, reportedly is the biggest between Los Angeles and Houston.

There are 63 business firms. Fifty-three of these stores are under one roof and open onto what is billed as the world's longest refrigerated and enclosed mall.

Encompassing 63,000 sq ft, the Chris-Town is air conditioned by 180 tons of "Arctic Circle" straight cooling and heat pump units. Eight units are 7½-ton remote heat pumps with supplementary electric strip heaters; eight units are 7½-ton straight cooling; four units are 10-ton straight cooling; four units are 4-ton heat pumps with supplementary electric strip heaters and one unit is a 4-ton straight cooling model.

LANDSCAPED MALL of Chris-Town Shopping Center is comfortably cool in summer and pleasantly warm in winter.

All 25 of these units were especially tailored to meet the requirements of this unusual installation as specified by the mechanical engineer. All units are fed with 480-volt a-c, 60-cycle, 3-phase power.

As shoppers walk into the main entrance of Chris-Town, they step through a 30-ft "curtain of air." Lush landscaping decorates the mall and courts.

The Courts of Fountains, Flowers, and Birds create unusual air conditioning requirements. Arctic Circle engineer Ralph Thomas said:

"The units were positioned in the particular way that would provide maximum heating or cooling required in each area. The moisture from the Court of Fountains, the great amount of glass in that area, and the unusual heat from the restaurant necessitated more cooling units over these locations."

At the main entrance are three large Arctic Circle cooling units. On each side of the Slipper Stairway are two 7½-ton heat pumps.

Arctic Circle refrigerated air conditioning is manufactured by International Metal Products Div. of McGraw-Edison Co. Installation at Chris-Town was made by J. H. Welsh & Son Contracting Co.

REVIEW of VACUUM for SERVICE ENGINEERS by Saunders & Williams

NEW!

A comprehensive STORY OF VACUUM written specially for SERVICE ENGINEERS!

Contents: Atmosphere and its pressure • Meaning of vacuum; how created, used and measured • High vacuum pumps and their care • Vacuum line size and their effect • Procedure for dehydrating, degassing and leak detection • High vacuum gages • Precision charging.

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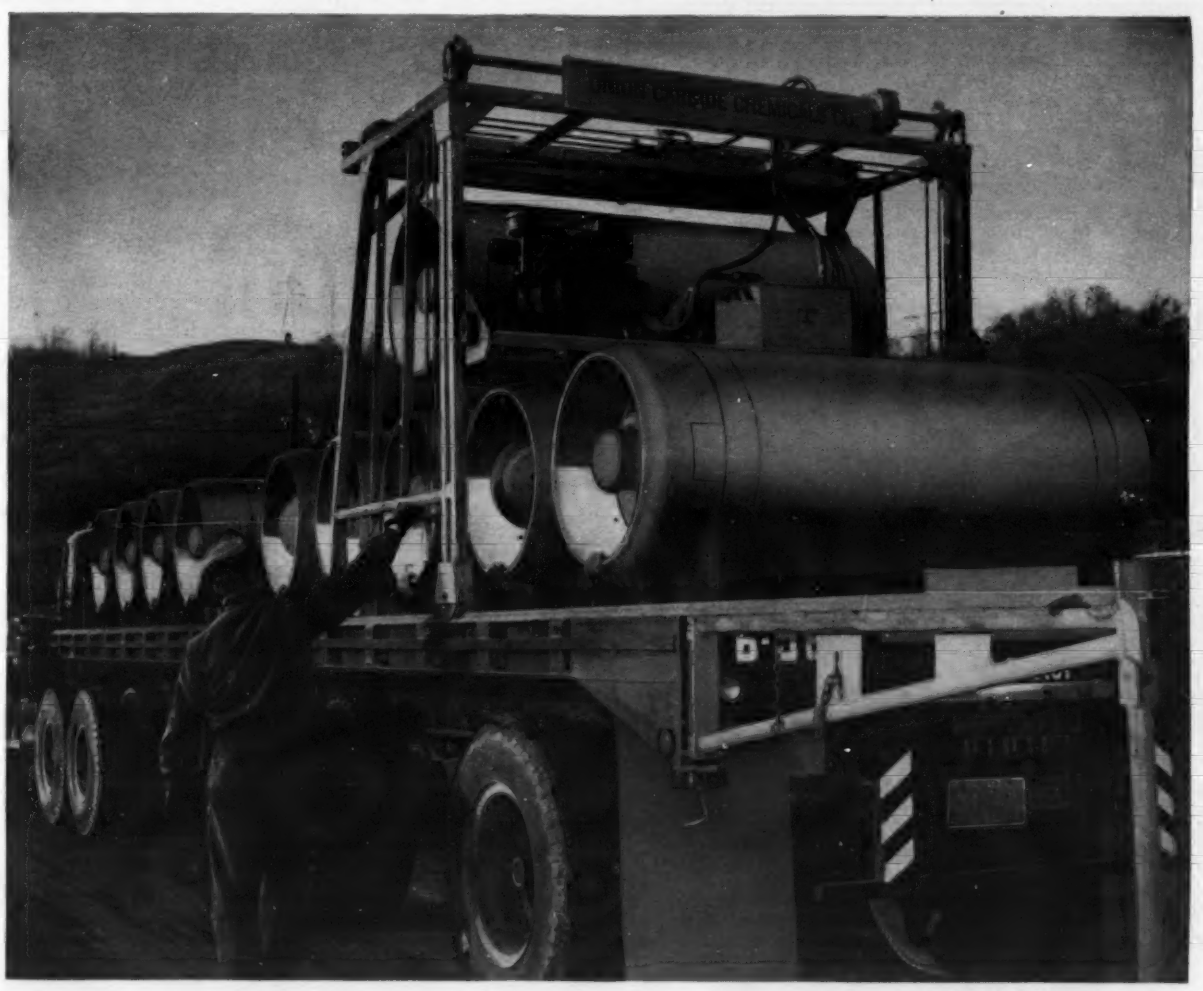
"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.



The Fast, Convenient, Low Cost Way... Ton Cylinders Delivered by

Ucon® refrigerants RACK TRUCKS

Convenience is the word for the Ucon Refrigerants Rack Truck...and *economy*, too. For refrigerant users preferring less-than-carload quantities, *and* individually packaged units, the Rack Truck reduces in-plant handling problems, eliminates need for special bulk storage facilities.

One-ton cylinders are unloaded directly onto fork-lift trucks or other haul away devices with the Rack Truck's own hoist mechanism...or if space permits, the Rack Truck can be driven right into your warehouse storage area.

Result: substantial savings in freight costs, greater handling safety, reduced outlay for cylinder deposit, and far fewer man-hours required for unloading, testing and handling...more profits for you!

Your local Ucon Refrigerants Representative has the whole, eye-opening story on the big savings that can be yours with convenient Rack Truck deliveries. Call him today...and put this money-saving fleet to work for *you!*

UNION CARBIDE

Ucon® refrigerants

These 5 Ucon Refrigerants will meet your refrigeration and air conditioning needs

- Ucon Refrigerant 11 Trichloromonofluoromethane
- Ucon Refrigerant 12 Dichlorodifluoromethane
- Ucon Refrigerant 22 Monochlorodifluoromethane
- Ucon Refrigerant 113 Trichlorotrifluoroethane
- Ucon Refrigerant 114 Dichlorotetrafluoroethane

UNION CARBIDE CHEMICALS COMPANY, *Division of Union Carbide Corporation*, 270 Park Avenue, New York 17, New York

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 1)

is that people in the back of an elevator always want to get out before those in the front.

Most students of the human race, particularly of the Genus Americanus, were conscious of that fact long before said Law was articulated.

They are equally acquainted with its converse, the Haughton Law, which finds that the rear line of people waiting for a bus always desires to enter ahead of the front of the line, and stay in front.

A discovery made by the *New York Times* aptly is called the Law of Tardy Plenty.

An innocent person is seized, for example, with the desire to possess a hand-warmer. In all stores he finds hand-warmers out of stock.

He writes letters of inquiry which go astray. Finally he gives up, and buys a pair of lined gloves. Immediately the Law of Tardy Plenty begins to operate. Hand-warmers appear on all sides, in stores, in ads, even at bargain prices.

And there is a law that if something is wanted for the home, and Mr. Husband offers to purchase it downtown, it turns out to be (when brought home) something quite different from the object desired.

Most intriguing law for our money is Parkinson's Law, formulated by C. Northcote Parkinson of the University of Illinois. This law has two branches—the Law of Multiplication of Subordinates, and the Law of Multiplication of Work.

It applies to all bureaucracies, both in government and business. Here's how it operates:

A man finds himself overworked. His first alternative is to resign; the second is to turn over half his work to a colleague; the third is to ask for the assistance of two subordinates.

He doesn't want to resign; and he doesn't want to split his job with a colleague, lest that person proves a rival for promotion.

So he demands two helpers—who will not rival him, but each other.

When one of the new two complains of being pushed too hard, it becomes advantageous to grant him two more aides. Therefore his colleague must have two, too. Presently each of these aides must have two assistants each, and so on *ad infinitum*.

All these chaps keep busy by checking the work of one another and having their own work checked. Documents go up and down the line of authority. Not only is the labor multiplied, but little gets done finally.

Parkinson's Law helps explain high prices, high taxes, why secretaries and typists and accountants are in such demand, and why stockholders continue to get shorter and shorter ends of the stick.

Stories of the Week

While traveling in the Orient a southern gentleman was accosted by a former manservant he hadn't seen in years.

"Sam, what are you doing way over here?" affabled Kunnel Beauregard.

"Kunnel, suh, I'se got de bestest job I ever had."

"Dee-lighted, Sam. Tell me about your work."

"I'se de sprinkler in a Sultan's harem."

"Sprinkler? What are your duties?"

"Well, suh, every evenin' the sultan's girlfriends line up. I sprinkles watah in dere faces. Soon as I find one which sizzles, I is thoo for de day."

"You're asking too much for this antique."

"But madame: Wages and the cost of materials have gone up recently."

Pacing back and forth in the garden of a mental institution, two inmates seemed lost in ponderous thought.

"I have it!" exclaimed one. "I shall invade Gaul on the morrow!"

"Take it easy, Julius," cautioned the other. "If I were Caesar . . . and, er, incidentally I am. . . ."

"Why don't you phone me from downtown," wailed an overworked wife and mother, "and say you're too busy to come home for dinner like other husbands do?"

Gags of the Week

So long as there is one pretty girl left on the stage, the professional undertakers may hold up their burial of the theater.—GEORGE JEAN NATHAN.

Now take the nose, for instance. Loyal and kind, from the daybreak of creation down to the present moment, it has stood before man's face and remained his best friend and adviser. Noses have remained in fashion longer than any other ornament that man has ever worn, which is proof enough of their popularity.—ZORA NEALE HURSTON.

"Thought I should alert you," Lawyer A confided to Lawyer B. "Our clients are dangerously close to agreeing."

An old timer is one who remembers when women married men for their money instead of divorcing them for it.—*Pipe Dreams.*

Verses of the Week

Be satisfied, and pleased with
what thou art,
Act cheerfully and well the
allotted part.
Enjoy the present hour, be
thankful for the past,
And neither fear nor wish the
approaches of the last.

I am only one
But still I am one.
I cannot do everything,
But still I can do something;
And because I cannot do every-
thing
I will not refuse to do the
something
I can do.

Last Gasp

There's a skunk in my basement," Mrs. Housewife phoned a police station aggravatedly. "How can I get it out of there?"

Officer McNally recommended that she scatter bread crumbs from her basement out to the yard, and then wait for the skunk to follow the trail.

Two hours later:

"I did what you told me," she wailed. "Now I've got two skunks in my basement."

Significant Valve Developments Come from Superior

In its close, working relationship with the refrigeration industry, Superior Valve & Fittings Company has engineered numerous trend-setting concepts into its valves and accessory products. From flare fitting to the most complex refrigerant transfer system, Superior has pioneered simplicity in design and construction. The result is exacting performance and virtually maintenance-free service.

Specify Superior and take advantage of Superior quality . . . in engineering, manufacturing, testing and performance. Superior Products are sold through leading refrigeration wholesalers . . . there's one located in your vicinity.

If your firm deals in liquids or gases under pressure, you'll be dollars ahead by investigating Superior Valve & Fittings Company. 3540

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valve and fittings company
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Henry, Higgins, Rehrig, Join GAMA, Name Delegates

NEW YORK CITY — Three manufacturing companies have been elected to membership in the Gas Appliance Manufacturers Association, according to Harold Massey, managing director.

The Henry Furnace Co., Medina, Ohio; Higgins Metal Products Co., Swanton, Ohio; and Rehrig Safety Controls division of Rehrig Pacific Co., Los Angeles, are the new GAMA members.

Henry Furnace, which manufactures gas furnaces, gas conversion burners, and gas unit heaters and duct furnaces, will be represented at GAMA meetings by R. N. Campbell, president, and R. W. Lindsay, sales vice president, will serve as alternate delegate.

Irving A. Higgins, president, will be delegate to GAMA for Higgins Metal Products, which manufactures draft hoods, barometric dampers, gas supply lines, primary air shutters, louvers, and ventilators. Robert C. Higgins, engineering vice president, will act as alternate delegate.

Rehrig Safety Controls, manufacturer of gas appliance regulators, will be represented at GAMA meetings by H. A. McIntosh, sales manager, and his alternate will be L. Kiser, secretary-treasurer, it was indicated.

FHA Loan Application Rate High In October

WASHINGTON, D. C. — The seasonally adjusted annual rate of applications for FHA mortgage insurance on new homes rose during October to the highest level since December, 1959, according to Commissioner Neal J. Hardy of the Federal Housing Administration.

The comparable rate for existing-home applications showed a slight increase but continued for the seventh consecutive month to hover around 550,000. The annual rate for starts, adjusted seasonally, reached the highest point since May, 1960.

The home mortgage totals include applications involving 123 units for home improvement loans under the new Section 203(k) and also the first application for a home improvement loan under Section 220(h).

BHC Elects Holtz to Board of Directors

NEW YORK CITY — Harold F. Holtz has been elected to the board of directors of the national Better Heating-Cooling Council, it was announced by Irvin L. Rechkemmer, president.

Holtz is vice president and general manager, Packaged Boiler Firetube Div., Cleaver-Brooks Co., which is a member of BHC's Commercial & Industrial Div.

Watsco Plans Manufacture of 4 New Products When New Plant Finished

HIALEAH, Fla.—Completion of the 35,000-sq ft plant-office building now under construction for Watsco, Inc., will permit the company to complete the development and commence the manufacture of a variety of new products, according to William Wagner, president.

As reported earlier in the NEWS, the ultra-modern building is scheduled to be completed this month.

In a message to shareholders, Wagner said Watsco plans to introduce new products to the refrigeration and air conditioning industry and also to other industries.

As soon as the new plant is finished, he indicated, the company intends to proceed with these products:

"1. Submerged welding equipment (patents pending). This is an improved, low cost method of welding stainless steel, monel, and thin metals. Prototypes have been sold and are operating satisfactorily. . . .

"2. Variations of our present patented check valves in larger sizes designed especially for original equipment manufacturers and for industries not especially allied to refrigeration and air conditioning.

"3. A new design of our electronic capacitor tester, suitable for new and greater applications as well as increasing sales to our present customers. . . ."

A fourth product listed is a new brake tester (patent pending) for automobiles. When used in accordance with directions, it will determine with precision whether or not automobile brakes are functioning properly and safely, it was explained.

Wagner also reported that negotiations have been completed for the purchase of an automatic screw machine corporation in Hialeah.

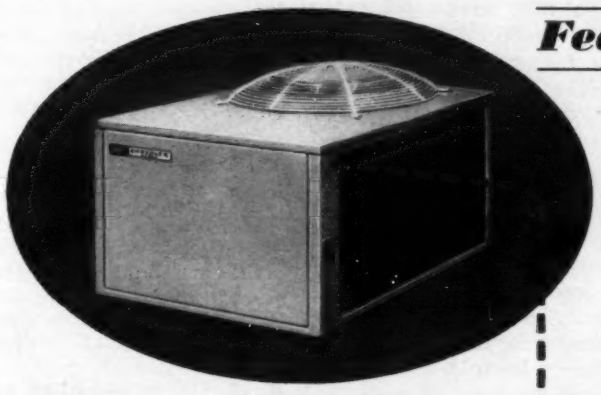
"It is anticipated," Wagner said, "that with this acquisition we will save considerably on component costs presently contracted out. Additionally, we expect an increase in our consolidated sales through its operations of approximately $200,000 per annum and anticipiate a satisfactory net profit after taxes based on our invested capital.

"With the added equipment and facilities, we expect to be able to effectively compete in the production and sale of other refrigeration and air conditioning products, as well as manufacturing parts for other industries located in our area."

Refrigeration and air conditioning products currently offered by Watsco include accumulators, capacitor tester ("Cappy"), door gasket notcher, fin-comb, compressor gaskets, "Hep" solvent, "Search" liquid leak detector, spun copper strainers, "Strain-O-Kaps," terminals, terminal seals, and hex wrenches.

Also offered are these types of valves: access saddle, access "T," adjustable line tap, can tap, capillary control, control (for tapping valves), flappers, line tap, line port, and "Magni-Chek."

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.



Featuring Chrysler's snap-in cooling

With the new Chrysler Model 1254 for residential air conditioning, installations are faster, easier, less expensive than ever before possible. It's factory-charged, factory-tested, so there's no on-site refrigerant work. Simply run the armored line from the cooling coil to the condensing unit . . . and snap it on. Takes only a couple of minutes, and a hole through the wall the size of a single brick. You'll handle extra jobs . . . without extra help.

The Chrysler 1254 also features the all-new "deep probe" motor guard, an overload protector wired directly to the motor windings. It eliminates the need for four separate (and complicated) control components . . . increases reliability and simplifies servicing.

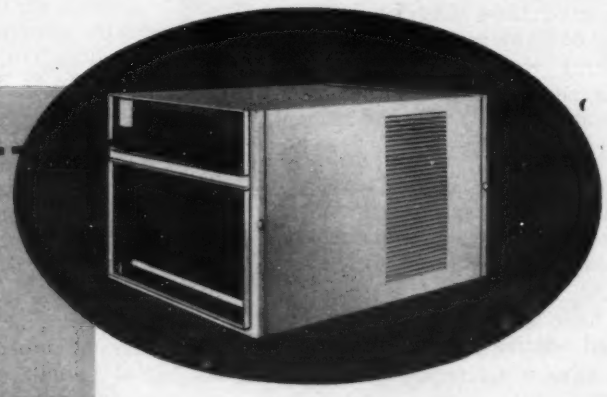
Add to these outstanding engineering advances a cooling capacity of 35,000 BTU's, and you have the most saleable system on the market.

Featuring Chrysler's New Model 1140

Built To Sell For Less Than $500 Plus Installation

This is really great news for your builder customers, and plenty of sure sales for you, too. This high-quality, low-priced Chrysler residential or commercial air conditioner is still another example of Chrysler's engineering leadership. Fancy frills and extra weight are gone, but you can count on Chrysler's reliability and minimum service. The 1140 delivers 33,000 BTUH — enough cooling power to cool up to 2,200 square feet of living space.

All the famous Chrysler quality and engineering advances are there, too. This, plus the wonderful price you can profitably quote with confidence—less than $500 plus installation — will put the Chrysler 1140 at the top of your list of best-sellers for '62.



WITH CHRYSLER, YOU CAN BE A

SHOW-OFF

With High Quality and Low, Low Cost

Featuring Chrysler's New Gas Furnaces

These smartly-styled Lo Hi-Boy gas furnaces are ideal teammates for either the 1140 or the 1254 air conditioners above. They're available in four capacities, from 80,000 to 150,000 BTUH. All feature new step-controls for smoother, quieter starting. All have built-in bottom panels to eliminate grouting. And conveniently-located knock-outs mean faster, easier installation.

These furnaces are part of a newly-expanded Chrysler line of 34 gas furnaces specially designed to meet builder requirements...competitively priced, with capacities from 50,000 to 200,000 BTUH. Call your Chrysler distributor today, and see Chrysler's new line of quality air conditioners and furnaces for 1962. Or write us for your copy of "The Chrysler Line is the Quality Line."

CHRYSLER
AIRTEMP
A Division of Chrysler Corporation
Dept. C-121, Dayton 4, Ohio

Editorial

Fallacies of Psychological Testing As They Relate to Personnel Management

BIG BUSINESS has made a big issue recently out of utilizing psychological tests for determining the pliability and potentiality of applicants for employment.

Ross Stegner, chairman of the department of psychology, Wayne State university (who is a widely recognized authority on personnel management) advises us *in re* this practice:

"Some of these commercial psychology testing firms are *bona fide.* They provide competent, well-trained people and procedures. Others are marketing nothing but glittering generalities."

High-pressure salesmen for a line of phony psychological "examinations" sometimes persuade a personnel manager to accept a sample demonstration, he illustrates.

The gullible junior executive takes the test, reads a flattering report on himself, is amazed by its "accuracy" — and then wastes a lot of his company's money on a gypsy-fortune-teller type of scheme.

"It is distinctive for nobody," derides Prof. Stegner. "It has no differential value for employe selection, placement, training, or any other personnel function."

Prof. Stegner onetime made this assertion in a speech to corporate personnel department curators. His audience laughed skeptically. No personnel manager worthy of the name and job could be taken in by such a fake, they felt.

So, this professor passed out to his audience printed "personality inventory forms," and requested that they be filled out and signed by each man present.

The Prof. promised to return to each of the 68 personnel men—with the aid of an IBM machine—a "personal analysis" within an hour.

This was done. Individual analyses—validated by a presumed computer—were read silently by the personnellers, with much nodding of heads to such statements as:

"You have a great need for other people to like and admire you."

"You have a tendency to be critical of yourself."

"You have unused capacity which you have not turned to your advantage."

"While you admit to a few personality weaknesses, your general drive compensates for them."

"Your sexual adjustment at times has presented problems for you."

"Disciplined and self-controlled outside, you tend to be worrisome and insecure inside."

"Frequently you have serious doubts as to whether you have made the right decision or done the right thing."

"You prefer change and variety, whatever their cost, to restrictions and tradition."

"You pride yourself as an independent thinker and do not accept others' statements without satisfactory proof."

"You have found it unwise to be too frank in revealing yourself to others."

"Some of your aspirations turn out to be unrealistic."

"Power over others is one of your major goals in life."

Upon discovering that all these alleged "personal analyses" were *identical,* the tested junior executives set up a terrific noise—apparently compounded by amusement at themselves for believing what "anybody would like to be told."

"My audience," adds Stegner, "really had suffered a demonstration of what has been called the Barnum Effect."

Industrial psychologists do have some valuable wares to sell. But quacks and charlatans are quick to move in on a new field such as this.

Footnote: Two years ago the President and five Vice Presidents of a highly successful corporation in our industry submitted anonymously to a battery of psychological "executive fitness" tests, prior to trying them on second-line executives. Five of the six top men flunked. (That ended THAT).

Question: Are we trusting too much in the concept of impersonal "science" itself, when attempting to evaluate highly *personal* human behavior, usefulness, creativity, and potentiality?

We place less and less emphasis on the joy of achievement and more and more on the achievement of joy. This is a social problem which we cannot evade much longer.—DR. WILLIAM S. CARLSON.

HENRY···MR. BULLGRAVY FROM THE DOODLETOWN OFFICE WILL BE WITH US A WHILE, SO MAKE HIM AT HOME IN YOUR OFFICE, WILL YOU?
TREMBLECHIN··· COULD YOU HAVE PURCHASING SEND IN A DESK CATALOG? AND COULD YOU MOVE YOUR DESK OVER TO THIS WALL?
OH-OH! IS IT THE AXEMAN OR THE EASER-OUTER OR JUST ANOTHER BIGDOME IN-LAW OUTLAW····
I GIVE THIS GUY A MONTH··· THEN WE'LL HAVE A NEW SHARE-CROPPER···
HENRY'S BEEN TRYING TO GET A NEW CHAIR CUSHION FOR TEN YEARS··· THIS GUY GETS THE NOOK DECORATED···
MEANTIME ALL POOR TREMBLECHIN GETS IS AN ULCER ON TOP OF HIS OLD ULCER···
WELCOMING THE NEW BROOM WHO RIGHT AWAY STARTS CHANGING THE CLOSET····
THANK AND A TIP OF THE HATLO HAT TO "OFFICE GALS," CANTON, OHIO
6-6

They'll Do It Every Time

by Jimmy Hatlo

OFF THE CHEST

QUESTIONS ADVISABILITY OF HIGH EFFICIENCY FILTERS IN FALLOUT SHELTERS

Research Products Corp.
1015 E. Washington Ave.
Madison 1, Wis.

Editor:

I have noticed an increasing number of advertisements on high efficiency filters for fallout shelters and more recently, I have been perturbed when my favorite air conditioning, heating, and refrigeration newspaper has published articles on the use of high efficiency filters for fallout shelters.

Perturbed because, not only are they expensive and not needed, but they might have a detrimental effect when clogged. The "Guide for Architects and Engineers Re Fallout Shelters," issued by the Office of Civil Defense Mobilization, and every government official we have contacted states the same thing in regard to fallout filters.

Page 12 from the above pamphlet states "For home shelters with hand operated blowers, a simple hooded intake is considered sufficient. For large shelters, however, fresh air intake velocities in mechanical and ventilation systems may be high enough to draw fallout particles into the shelters. Therefore, good quality commercial air filters should be installed. High efficiency filters that would remove sub-micron size of particles are not required for fallout shelters."

As the conscience of the industry, a good article by your paper will clarify this problem.

DALE O. BENDER,
Chief Sales Engineer

* * *

Answer: We wish we could publish immediately an authoritative "this is it" article on air filtration for fallout shelters, but the situation seems to be that there is as much, if not more confusion over this question as there is in the entire Civil Defense program.

There has been some talk that the document which you cite is no longer the official word on the subject, and there are also reports that Civil Defense agencies and possibly some branches of the Armed Services are about to issue new suggested specifications and standards for air filtration in fallout shelters. We certainly plan to continue reporting on this subject.

2 READERS LIKE SILVER SHIELD COVERAGE

B. P. Rhinefort
Cooling—Heating—Industrial Ventilation
Ft. Worth, Texas

Editor:

Your article "Is Silver Shield Successful?" is directly to the point and to me it's highly impressive. My one big hope for the industry is that a lot of contractors in the air conditioning business as well as servicemen read your article.

I do feel that one of the reasons for it not taking hold in this area is that contractors seem to feel that it is only for heating and that it originated up north for that purpose and that down here the situation is reversed. But we both know differently.

Again, I want to compliment you on your fine article.

B. P. RHINEFORT

"Freon" Products Div.
E. I. du Pont de Nemours & Co.
Wilmington 98, Del.

Editor:

I have finished reading your article entitled "Is the Silver Shield Program Successful?" and I want to tell you what a fine piece of writing this was.

It certainly gives the clearest picture of the Silver Shield program that I have seen to date. Your evaluation of the success and failures of the program was an outstanding example of good coverage.

JOSEPH C. HOOPES,
Manager, Field Distribution

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Dunham-Bush Shows Products, Restates Consulting Engineer, Contractor Policy

CENTER OF ATTENTION at the recent Dunham-Bush product and policy symposium at the Hotel Kenmore, Boston, was this fin radiation display—one of several product exhibits appealingly presided over by Miss Su-Su Smith, "Miss Massachusetts" and a candidate in the forthcoming "Miss World" contest.

BOSTON—A group of 460 consulting engineers and contractors attended the recent product and company policy symposium held by Dunham-Bush, Inc., at the Hotel Kenmore here.

Of particular interest to the two groups represented were Marketing Manager John Roth's remarks regarding Dunham-Bush policy on working with consulting engineers and with contractors.

"It strikes us that there's a lot of unnecessary confusion in our industry," he stated. "And a firm reaffirmation of principles seems in order. At Dunham-Bush, our policy is simple and straightforward. We are not in competition with the consulting engineer."

"We are glad to provide product and application information where it's desired and we're happy to furnish any assistance the consulting engineer requests. But the lines and limits of responsibility are clear cut. Wherever there is a consulting engineer involved, it's his job—not ours—to do the engineering and write the specs. Any attempt to usurp the engineer's prerogatives jeopardizes the particular job concerned and does a disservice to his client."

"Similarly," Roth continued, "Dunham-Bush does not compete with contractors. We work through them. This session itself—and others like it which we're conducting throughout the country—is an example of how we cooperate with contractors. Any manufacturer who sets out deliberately to by-pass the contractor is courting trouble — particularly on the question of responsibility."

Utilizing slides and product cut-aways to illustrate his talk, Roth discussed the company's line of multi-drive compressors, low silhouette condensing units, roof-mounted air conditioners, "Brunner-Metics," and air handling units.

On display, in addition to the products reviewed, were Dunham-Bush refrigeration units, package chillers, pumps, steam converters, steam and hot water specialties, and "Brunner-Packs."

In addition to discussing Dunham-Bush products and restating company policy, Roth briefly reviewed recent company history and sketched the backgrounds of key officials. A hospitality hour and buffet dinner preceeded the product symposium.

The company indicated it received good reports on the meeting from several of the men in attendance. It quoted one contractor as stating:

"Dunham-Bush has laid it on the line, with no hedging. And that's a reassurance to us contractors. We're not in business just for our health. And unless we know where we stand with a particular manufacturer, we're hesitant to deal with him. Who wouldn't be?"

Pioneer Mfg. Expands Plant

LOS ANGELES—Pioneer Mfg. Co., manufacturer of forced air furnaces, air conditioning equipment, wall heaters, kitchen appliances, and residential and commercial water heaters, has announced a sizeable plant expansion program to increase the company's efficiency.

The announcement was made by Ray A. Polverini, president.

"The new expansion program is still another point of progress and is the result of nearly 40 years of Pioneer growth under the continuous management of the Polverini family," is was pointed out.

Heart of the expansion program, which involves more than a million dollars, is an addition to the company's existing plant in the City of Industry.

This addition, located on the firm's 30-acre site, will add more than 100,000 sq ft of manufacturing and warehousing facilities, and will bring all Pioneer manufacturing and assembly operations, from raw steel to finished products, together at one location, in a single self-contained production unit.

The addition will be equipped with the most modern automatic production machinery and equipment, it was stated. The new plant will also permit "an even more intensified research and development program."

It is expected that the new Pioneer plant addition, located at 17240 East Depot St., City of Industry, will be completed by the first of the year. Plant Manager Alton Bossert will be in charge of the consolidated production operations.

Executive headquarters and other offices will remain at 3131 San Fernando Rd., Los Angeles 65, for an indefinite period.

Trane Opens Office In Jacksonville, Fla.

LA CROSSE, Wis. — The Trane Co. recently opened a Jacksonville, Fla. sales office at 1143 Mary St., W. D. Graham, Trane vice president, announced.

The office will cover Nassau, Duval, St. John's, Putman, Baker, Columbia, Union, and Suwannee counties.

Richard E. Goettling and George W. Hanson have been assigned as sales engineers for the office, which is under the management of M. T. Hartman, Trane Gainesville sales office.

Keeps beverages colder on hot days...installs quickly... performs perfectly!

OFFERS BIG CUSTOMER ADVANTAGES: Dial adjusted cut-out settings on the Ranco Model A12-1560 Replacement Control for beverage coolers *keep inside temperature at desired level, regardless of outside temperature fluctuations.* Variable cut-out settings range from 19° to 29° F. Other advantages include manual OFF position on the dial knob, and constant cut-in (factory setting) of 39° F.

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Replacement Control For Beverage Coolers, UL Approved.

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NWAHACA Technical Program--

(Continued from Page 1)

Casberg of the U. S. Dept. of Defense, who also disclosed that uniform "tri-service" specifications for housing have been agreed upon and are now being issued by the Air Force, Army, and Navy.

Each of the three services is issuing these specifications on their own, which means that the forms will differ, Casberg said. The contents, however, will be identical in all three, he declared.

Essentially, the new specifications merely combine those already in use, but some minor differences have been eliminated, he added.

Military Has 320,000 Houses

Pointing out that the military now has 320,000 houses, Casberg explained that "we think our policies have to be stated in rather general terms."

A controlling factor in Dept. of Defense specifications is the fact that operation and maintenance are highly important, Casberg said, commenting also that this "is not fully understood by industry."

More than $2 billion a year is now spent by the D.O.D. for maintenance and operation of real property, while the current annual rate of building is about $1.2 billion, according to Casberg.

Also, because the government has to accept the lowest bid, "we must protect ourselves with higher specifications," he explained. "We require perhaps better construction and equipment—but no frills in housing. "We're subject to statutory limitations on cost," Casberg explained.

Planned For Minimum Life of 25 Years

Military houses, he went on, are planned for a minimum life of 25 years, and some much older than that are still in use. D.O.D. also prefers to engage local architect-engineers so that the design will fit in with local custom and meet local problems, and for similar reasons prefers local contractors, Casberg said.

Being the landlord of 320,000 houses, however, the D.O.D. does have considerable experience to back up its specifications, he points out.

"We've heard that our requirement of 16-gauge heat exchangers in furnaces is thought outmoded by industry, but in one Capehart project using lighter gauge we have already replaced all the heat exchangers," Casberg declared.

Low First Cost Is Not Prime Objective

"We believe we have sound engineering reasons for our specifications. Low first cost is not our objective. We're concerned with long-term owning and operating costs," he commented.

One of the big problems in connection with heating and air conditioning in military housing, although it involves other things, too, is poor access to equipment for maintenance, Casberg indicated.

Three reports on recent cooperative research at the University of Illinois were presented during the technical session.

Modulation of Heat Input Study

Modulation of heat input can provide a more even temperature distribution in a house during milder weather, but it offers little or no improvement during severe weather conditions, M. N. Patterson told the group.

Such modulation, though, can make possible the use of a single year-round airflow rate based on summer requirements, thus avoiding the need for two-speed fan arrangements in year-round systems, he said.

Tests made with electric duct heaters controlled by individual room thermostats showed no advantages in minimizing room-to-room temperature variations except under severe wind conditions, Patterson found.

Conducted in Research Residence No. 4, tests involved four different systems: (1) gas furnace with straight on-off control, (2) gas furnace with thermostatically controlled modulating gas valve operating over a range of 100% to 30% capacity, plus off, (3) central electric furnace with six-step sequential control, and (4) electric duct heaters controlled by individual room thermostats.

In the test for variation in room temperature resulting from cycling of the heating plant under outdoor conditions of 50°F and 10 mph wind, all four systems met Silver Shield standards, Patterson said. Cyclic variation in System 1 (see above) was over 2°, less than 1° in System 2, less than ½° in System 3, and 1.2% in System 4.

At 30° outdoor temperature and no wind, the room-to-room temperature variation was less than 1½° for all four systems, but with a severe wind System 4 maintained less than 1½° variation with the other three systems exceeded 3°.

"Modulation is not the final answer, but it is one important component of a quality system," Patterson concluded.

Accuracy of Heat Loss Calculations

Another series of tests on Research Residence No. 4, as discussed by B. W. Hryekewicz, to determine the accuracy of heat loss calculations previously made, showed that the calculations were okay.

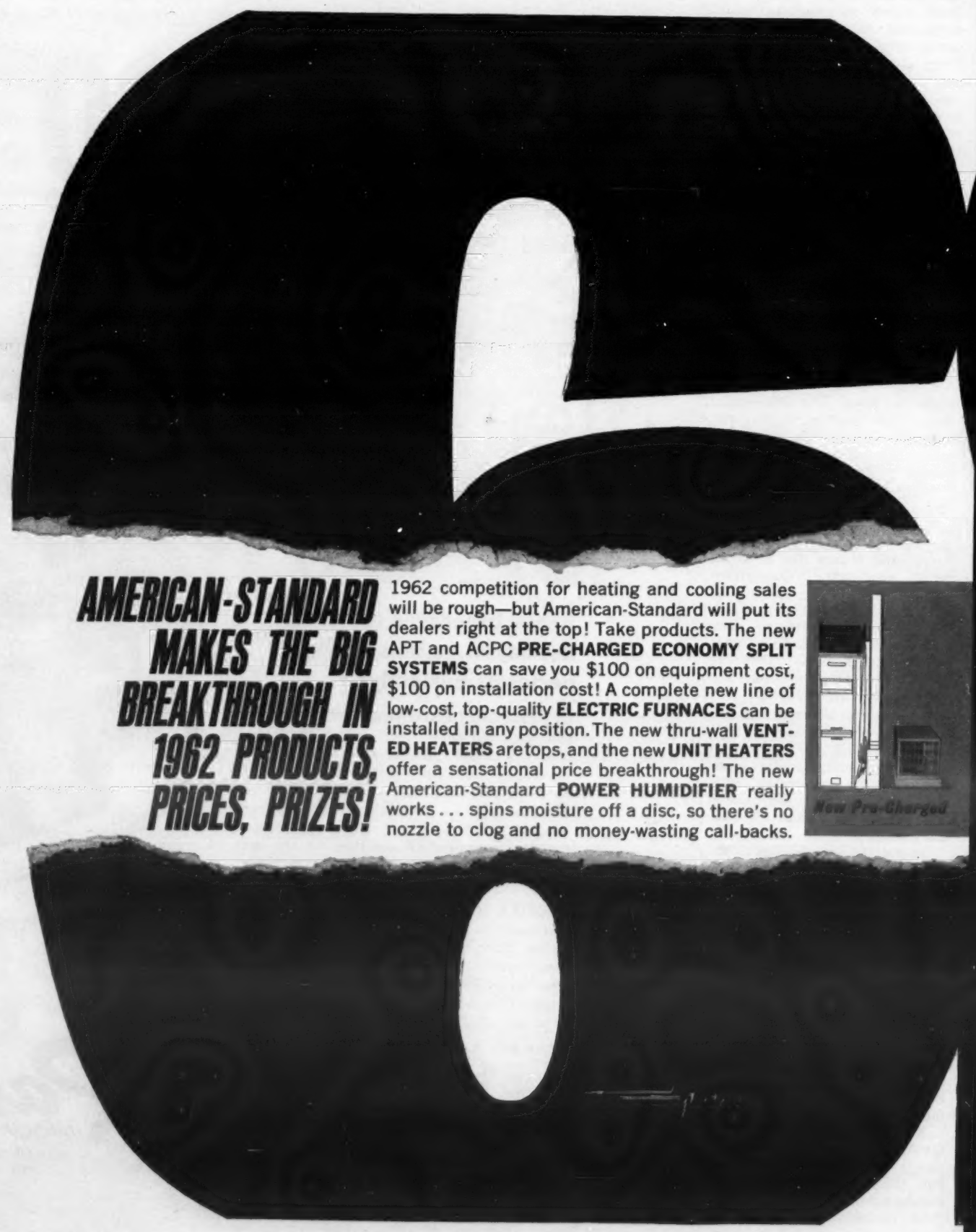
It was found that wind and solar intensity can influence daily energy consumption by as much as 20%, and that internal loads in this house satisfy about 15% of the daily heat loss.

In still another series of tests on the research residence, it was determined that present methods of calculating heat losses due to infiltration are sufficiently accurate, if proper care is taken in selecting infiltration factors, according to J. H. Healy.

These tests were conducted by filling rooms with helium gas and then measuring the speed of dilution of the helium by air, using an instrument developed by the National Bureau of Standards.

Importance of infiltration in heat loss was emphasized by

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.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1962 competition for heating and cooling sales will be rough—but American-Standard will put its dealers right at the top! Take products. The new APT and ACPC PRE-CHARGED ECONOMY SPLIT SYSTEMS can save you $100 on equipment cost, $100 on installation cost! A complete new line of low-cost, top-quality ELECTRIC FURNACES can be installed in any position. The new thru-wall VENTED HEATERS are tops, and the new UNIT HEATERS offer a sensational price breakthrough! The new American-Standard POWER HUMIDIFIER really works . . . spins moisture off a disc, so there's no nozzle to clog and no money-wasting call-backs.
New Pre-Charged

Healy, who said it accounted for about 20,000 Btuh of the total — slightly less than 65,000 Btuh—on this house, and could reduce the relative humidity to the discomfort level.

"But some infiltration is always essential," he said. "The problem is not to stop infiltration, except perhaps to reduce it on occasion, but to calculate it accurately."

Wind speed, he also said, has far more influence on infiltration than the indoor-outdoor temperature difference.

Venting Gas and Oil Equipment

Problems of venting modern gas and oil burning furnaces and appliances were reviewed by Kendall H. Flint, director of technical services for the Gas Vent Institute.

Contractors were reminded by Flint that heat going up the flue is not necessarily wasted. The energy represented by this heat removes the products of combustion and aids in providing draft and ventilation for combustion.

Venting was rarely a problem with a coal-fired furnace because the constant heat kept the chimney warm and maintained a good draft, Flint explained, adding that "the older oil burners with 600° stack temperatures were also okay."

The new type oil furnaces using induced or forced draft, however, require new type vents because the stack temperature is less, he said.

"At first it wasn't thought necessary to vent gas appliances, but they, too, have to be vented," Flint emphasized, pointing out that the products of gas combustion include nitrogen, carbon dioxide (carbon monoxide if not enough oxygen is present), and considerable water vapor.

He also asserted that "you need ventilation just as much with electric heat. As AGA says, 'don't live in a vacuum,'" he commented.

Although representing a group that promotes a double-wall metal vent design, Flint said no draft problems should be encountered with "a properly lined brick chimney going up the inside of a house. But an outside chimney may not work in all cases, and many brick chimneys are too large," he declared.

'Check Draft Problems Under Worst Conditions'

Servicemen were cautioned by Flint that when checking out draft problems associated with furnaces or appliances, "check them under the worst conditions, not the best."

In other words, turn on the kitchen exhaust fan and the clothes drier because these may affect draft, he advised.

He also pointed out that while an attic exhaust fan usually isn't running when the furnace is in use, such a fan could affect the draft on a gas water heater, which is used year round.

Dealers Urged To Eliminate Guesswork

The NWAHACA technical session wound up with a short discussion by Lorin G. Miller, dean emeritus of Michigan State college, urging that dealers strive to eliminate guesswork in sizing and installing systems; and then Herbert T. Gilkey, director of technical services for the association, reviewed the new Manual J, the all-industry method of calculating heat losses and gains.

GAMA Reports

September Furnace Shipments 5.5% Above Last Year

NEW YORK CITY—September shipments of gas-fired residential furnaces and boilers were 5.2% above the volume reported for the same month of last year, the Gas Appliance Manufacturers Association reports.

The month's unit sales included 109,300 furnaces and 19,294 boilers, compared to 103,600 furnaces and 18,600 boilers dispatched in September, 1960. The percentage increases for the two types of equipment were 5.5 and 3.7%, respectively.

GAMA's monthly telegraphic survey of manufacturers disclosed that in the first nine months of this year 679,300 gas furnaces and 111,503 gas boilers were sent to market. These totals were 1.4 and 6.5% ahead of the 670,100 furnaces and 104,662 boilers dispatched in the same period of last year.

Sales of gas conversion burners numbered 17,800 in September and 81,700 for the nine-month period. These figures were down 19.5 and 15.4%, respectively, from the year-ago amounts, 22,100 and 96,600.

Combined sales of the three types of central heating equipment totaled 146,394 in September and 872,503 for the nine-month period. These were improvements of 1.5 and 0.1% over the comparable amounts, 144,300 and 871,362.

Edward R. Martin, GAMA's director of marketing and statistics, said the September and nine-month shipment totals for other types of gas heating equipment were as follows:

Vented recessed wall heaters — September's sales accounted for 36,500 units and the January-September period totaled 240,000. The 1961 figures were 8.1 and 8.5% less than last year's, 39,700 and 262,200.

Room heaters and other types of gas direct heating equipment — 128,500 units sold in September and 699,800 in the first three quarters of the year. Sales of this equipment were 14.6 and 19.2% less than last year's amounts, 150,500 and 866,400.

Gas floor furnaces — The September amount, 12,100, was 14.2% under the 14,100 sold in the same month of 1960. The nine-month total, 52,100, was 15.8% less than last year's 61,900.

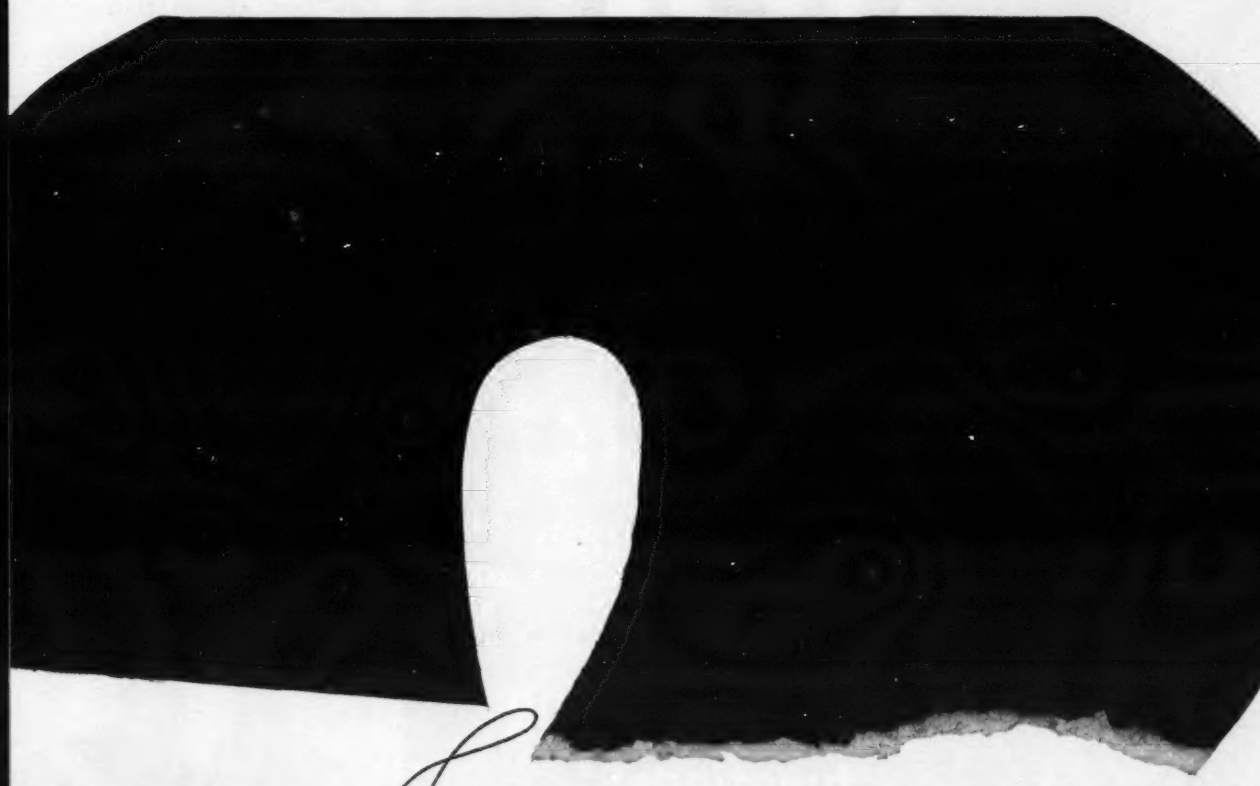
Gas unit heaters and duct furnaces — Shipments of this equipment numbered 14,500 in September and 107,100 for the nine-month period. In 1960 the comparable amounts were 15,400 and 111,800, making the current year's totals decreases of 5.8 and 4.2%, respectively.

The GAMA report is based on a survey of manufacturers who account for a majority of the output in each category, with the responses expanded to show national shipment estimates.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.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"HEYDAY HOLIDAY" FOR TWO!
You win a "HEYDAY HOLIDAY!" When you sell the new 1962 American-Standard cooling line, at the new competitive prices, you can win a free vacation week-for-two in an exotic foreign land with a rich, historical past; enjoy luxurious hotel accommodations with superb food; gay night life; visits to famous landmarks. Relax at one of the world's greatest seaside resorts for sunning, swimming, golf and deep-sea fishing. It's all free—plane fare, hotels, food, entertainment—everything! Our liberal preseason finance plan helps you earn the contest points you need fast! Want more information about this great free vacation? Contact your American-Standard Air Conditioning Division Distributor right now!
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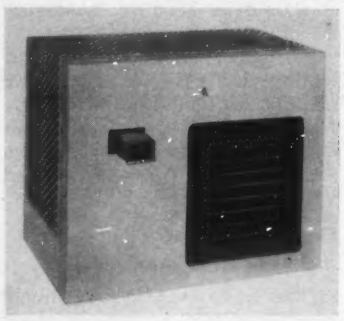
Portable Flaker Makes 250 lbs Per Day



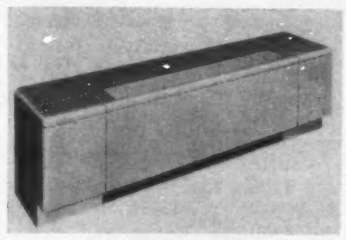
● The addition to its ice machine line of a new portable continuous flaker has been announced by Freez King Corp., Dept. AHRN, 2518 West Montrose Ave., Chicago 18.

This compact unit is only 21½ in. wide, 17¼ in. high, and 15¼ in. deep, the company said. The cabinet has a grey hammerloid finish, with perforated top and sides. The ice auger motor is ¼ hp, as is the air-cooled hermetic condensing unit. Ice making capacity is rated at 250 lbs in 24 hours, with 75° room temperature and 60° water.

Stressing the simplicity of servicing and maintenance, the company said: "All panels are completely removable, and the mechanism is accessible from all sides. The ice auger can be instantly removed for cleaning and servicing, and can be completely taken apart."

The flaker weighs 105 lbs, "so it can readily be moved just exactly where its ice production is needed."

Offer 2 Models of Lo-Line Seasonmaker

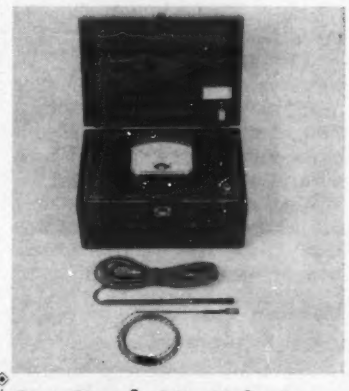


Free-Standing Model

● A new "Lo-Line Seasonmaker" 12½ in. deep and 14½ in. high was recently added to its Seasonmaker line by McQuay, Inc., Dept. AH&RN, 1600 Broadway, N.E., Minneapolis 13, Minn.

The Lo-Line Seasonmaker is available in a flush wall model or in a free-standing model which permits draperies to be hung behind the unit, it was pointed out.

Four sizes from 200 to 600 cfm are available. Lo-Line Seasonmakers come in seven decorator colors. They have a permanent split capacitor motor, slide out fan deck assembly, motor disconnect plug, large access doors and piping compartments, 1-in. vinyl coated insulation, and air filter removal without front panel removal.



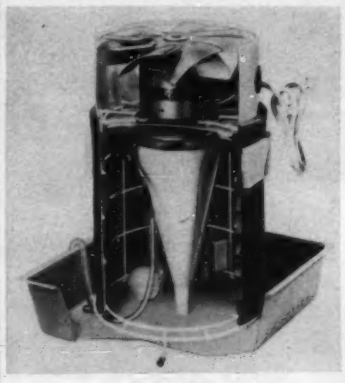
Can Read Air Velocity, Temperature Directly

● Direct accurate reading of air velocity and air and surface temperature is possible with its new "Flowtronic 55," according to Flow Corp., Dept. AH&RN, 11 Carleton St., Cambridge 42, Mass.

Temperature measurement range is 20°F to 220° and air velocity ranges are 0-1,000 fpm, 1,000-2,000 fpm, and 2,000-4,000 fpm.

A rapid response electrical output (d-c to 1,000 cps) suitable for use with a chart recorder is an additional standard feature. The temperature scale is linear over the entire 20°F to 220° range while the velocity scale is linear at high velocities.

"The Flowtronic is useful in mechanical or electrical component cooling problems; air flow, cooling, and distribution studies, and similar applications," the company said. "Its very high sensitivity at low flow rates makes it particularly useful for detecting slow air circulation in enclosed spaces."



Cone Humidifier Traps Dust, Odors

● A new humidifier said to evaporate a high volume of water and also trap dust, water minerals, and water soluble odors (including tobacco smoke) is now being marketed by Associated Mechanical Services, Inc., Dept. AH&RN, 688 Jenks Ave., St. Paul.

The humidifier named the "Mist-I-Cone" (Pat. Pend.), utilizes an unusual principle to maintain the recommended 35 to 45% humidity during the winter heating season, the company said.

This is how it works: "Centrifugal action of a quietly spinning cone picks up water from a reservoir pan and throws it against a 'breaker comb.' This water thoroughly saturates a high-porosity evaporating mat enclosing the unit. A self-contained fan pulls dry air into the unit's interior and forces it out through the moisture saturated mat. Air that leaves this mat and moves in the ventilation ducts contains 90 to 95% humidity."

Associated Mechanical Services is currently forming a new company to take over the manufacturing and marketing of the humidifier.

NEW

line voltage
THERMOSTAT
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control of
all heating-cooling
functions!

Series 822

How settings are locked

Where it is desirable to lock settings, installer removes cover and pushes out factory-installed key "B" from each adjusting knob. This disconnects knob from adjusting shaft. Then, user may insert special key "A" (supplied for key chain use) through knob slot and turn to make desired settings . . . remove key and thermostat is locked as adjusted.

Take your choice...heating, cooling or heating-cooling...each features unique, easy-to-use, locking-type knobs

Here's the line voltage thermostat that has "everything" desired for accurately controlling temperature in motels, schools, offices and similar installations.

It has easy-to-read temperature and function selector dials. It has an accurate bimetallic thermometer with vertical dial. It has exclusive, locking type adjusting knobs, attached to cover but connected to adjusting shafts by factory-installed "keys" within the knobs. It has a unique, built-in but concealed adjustable high limit stop for temperature dial. It has an unusually sensitive element and mechanism which provide low operating differential at all voltages and all amperages within its rating. It has easiest "field wiring" ever... simply connect to large terminals *on back of thermostat.* And, it has modern "thin-line", compact styling. Learn more about this new thermostat... write to the Penn factory for Bulletin 3233.

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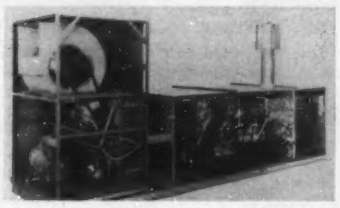
AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Welbilt Adds Roof-Top Heating, Cooling Unit



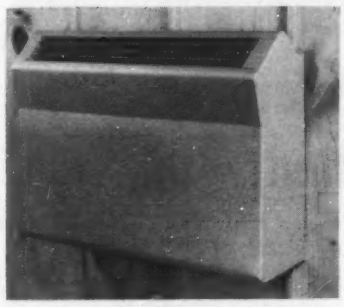
● A new line of combination heating and cooling units designed for roof-top installation and designated as the WAGH Series has been introduced by Welbilt Air Conditioning & Heating Corp., Dept. AH&RN, Farmingdale, N. J.

All units are pre-piped and wired at the factory and delivered with a refrigerant test charge. The equipment is mounted on rigid iron channels and equipped with rigging holes at balance points to simplify installation. Foil-backed, fiber glass insulation is used throughout. Permanent-type, expanded aluminum filters are standard. The electrical system includes a 24-volt control panel with a master disconnect circuit breaker, it was noted.

The furnace section is a specially designed unit, it was stated. Constructed of heavy gauge aluminized steel, it "offers maximum resistance against weathering." Features include an automatic draft diverter, built-in stack switch, AGA-approved gas burner with auto ignition pilot and main gas shut-off, and automatic pressure regulator. Oil-fired units are also available.

The cooling section features an air-cooled condenser whose capacity is "materially increased by the addition of a high volume centrifugal blower. By effectively overcoming unfavorably winds it prevents short-cycling. A built-in accumulator-surge tank eliminates oil 'slugging.' Separation of return and discharge air connections, by the furnace section, simplifies installation, partcularly when this is accomplished with ductwork."

The WAGH Series is available in models from 5-35 hp, all rated under ARI standards.



Silencer Reduces Room Cooler Noises

● Called the "Soft Aire Silencer," a unit which is claimed to reduce return and supply air noises of a room air conditioner is being offered by Aire Silencer Co., Dept. AH&RN, P.O. Box 78193, Los Angeles 16, Calif.

The device, which fastens to the grille of a room unit, also "directs the air flow into the room properly," the company said. Another advantage cited is that guests will not touch knobs or controls.

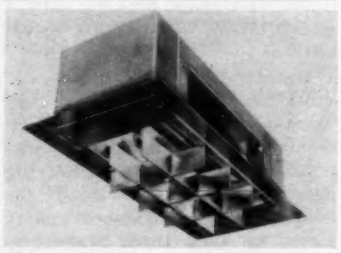
Shake Machine Dispenses 3 Flavors, Base

● A shake machine that dispenses three flavors of finished shakes automatically, plus neutral shake base for all other flavors, has been introduced by Sweden Freezer, Dept. AH&RN, 3401 17th Ave. West, Seattle 99.

This new model, the "Multi-Flavor 1-217 ShakeMaker," eliminates the extra time-consuming step of adding flavoring in the preparation of milk shakes, the company said.

"One touch of a toe meters the correct amount of flavoring into the cup, dispenses the shake base, and blends the two thoroughly," it was explained. "The entire operation takes only six seconds and eliminates eight steps necessary in the hand-dipping method of preparing milk shakes.

"It's all done with a foot control, leaving the hands free to hold several shake cups. There's a pedal for each flavor in the machine and one for the neutral shake mix for all other shake flavors. To make a shake of a flavor other than one of three that can be dispensed automatically, the operator adds the desired syrup from his fountain and depresses the neutral pedal on the machine to add and blend the shake base. If four flavors are desired automatically, the operator can flavor the shake base with vanilla."



3 Elements Available For Infrared Heater

● A new "Chromalox" electric infrared comfort heater for installation in marquees of hotels, stores, theaters, terminals, and other public buildings, has been announced by Edwin L. Wiegand Co., Dept. AH&RN, 7500 Thomas Blvd., Pittsburgh 8.

The heater is designed for recess-mounting and has a golden finished, anodized aluminum reflector, frame and louvers. A choice of three electric heating element types are available—metal sheath, quartz tube, and quartz lamp.

"The metal sheath type offers low cost per kw capacity and greatest resistance to mechanical damage or vibration," the company said. "The quartz tube type is ideal for use where shielding from wind is not feasible. Quartz lamp type is desirable where a combination of heat and light is needed."

Chromalox input controllers and contactors or manual circuit switches are optional for controling the operation of the heaters. The heaters are offered in sizes from 11 in. in length to 43 in., and 600 watts to 5,250 watts capacity.

Design Furnace for Cooling Installations

● The Nesbitt Series K gas-fired duct furnaces for both commercial and institutional installations are now available in two types, according to John J. Nesbitt, Inc., Dept. AH&RN, State Rd. & Rhawn St., Philadelphia 36, Pa.

The Series K gas-fired furnaces are primarily designed for air conditioning installations but can also be used with custom ductwork for heating and process applications, it was pointed out. The unitary type furnace is designed for single unit applications and is manufactured in four sizes ranging from 75,000 to 160,000 Btuh input. The sectional type furnace is for use as individual units or combined in multiple unit banks for large systems. Capacities of this type range from 215,000 to 300,000 Btuh input.

Why dealers want the Scotsman franchise

Scotsman Super Cubers are available in capacities from 50 lbs. to 500 lbs. Cabinets install under counter, against wall, as built-ins. Only one water and one drain connection, standard electric connections.

Scotsman Super Flakers have self-contained, heavily insulated storage bins. Thermostat automatically controls refilling of bin. Capacities from 100 lbs. to 4,500 lbs. Operate from standard electric connections.

The market doesn't have to be cultivated. It's already there with the spadework done. And it's expanding fast. Scotsman ice machines can be sold wherever food or drinks are served: restaurants, drive-ins, hospitals, clubs, bars, schools and institutions.

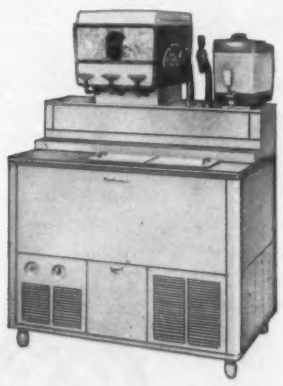
Your customers think well of Scotsman. How do we know? Because Scotsman is the largest selling brand of ice machines year after year. We think this means customers have a preference for Scotsman's quality and dependability. We use product research to find ways to continually make Scotsman better . . . and to give you what your customers need.

We advertise . . . more than anyone else in the ice machine industry. True again this year as in other years. Scotsman has full schedules in trade magazines to blanket every market. Many ads will be in full color. Your prospects will be pre-sold on Scotsman quality and dependability.

Dealers sell more when they make money. And Scotsman dealers make money. Dealerships are carefully selected so that each dealer can have a profitable volume of business. Besides the profits from full markup, Scotsman dealers enjoy a continuous and profitable income from related products.

If you're interested in making money . . . mail in the coupon now for complete facts about the Scotsman dealer franchise.

QUEEN PRODUCTS DIVISION · KING-SEELEY KST THERMOS CO., Albert Lea, Minn.



Scotsman Combination Ice Machine and Drink Dispenser available in two models. Produce and store from 350 lbs. to 650 lbs. of ice per day. Will dispense two, three or four flavors. Two draft arms for plain cold water and carbonated water.

You profit most with

SCOTSMAN®

ICE MACHINES

Please send me dealer franchise information

Name_____

Firm_____

Address_____

City_____

Zone_____ State_____

Mail to: Queen Products Division, King-Seeley Thermos Co., 2012 Front Street, Albert Lea, Minn.

GSA Personnel Indicate

Air-Cooled Condensers Cut Maintenance Cost, Improve Reliability In Government Buildings

WASHINGTON, D. C. — Air-cooled condensers which have replaced evaporative type units in a number of government office buildings here have cut maintenance costs and improved reliability of the buildings' air conditioning systems, according to reports made by maintenance personnel.

Thirty-two air-cooled condensers, manufactured by the Halstead & Mitchell Co., Zelienople, Pa., have been installed to date in the air conditioning systems of buildings T-4 and T-5 of the General Services Administration.

These GSA buildings house offices of the Federal Aviation Agency, the Navy, and the Central Intelligence Agency.

Each air-cooled condenser has a nominal capacity of 15 tons and has replaced two 5-ton evaporative type units. Previously there were 184 of the 5-ton evaporative condensers used in these two buildings and the GSA will eventually switch to air-cooled units completely, it was stated.

The evaporative units were installed almost 20 years ago and with an increased demand for air conditioning in the Washington summer heat, the loads on these units were so heavy that they were in frequent need of maintenance and repair.

The previous units were roof mounted, and the roofs were so hot in the summer that water for the evaporative condensers came out of the line at 130°F, it was reported. To this was added the reflected heat from the roof, making an unusual burden on the capabilities of the evaporative units.

To get away from the roof heat, the 32 Halstead & Mitchell air-cooled condensers have been installed on the ground alongside the offices which they service. These units keep the environment cool and comfortable for the 2,000 people working in the offices. Each 15-ton condenser serves 12 to 14 offices, and have been relied on for round-the-clock service.

ONE of the 32 air-cooled condensers that have replaced evaporative type units in the air conditioning systems of government buildings in Washington, D. C. is shown here. Each is a Halstead & Mitchell horizontal discharge type unit, rated at 15 tons. The units are mounted on the ground next to the buildings whose packaged air conditioning systems they serve. With the installation of these units, the General Services Administration estimates that $250 in maintenance costs can be saved per unit per year.

Previously, maintenance workers of the GSA experienced breakdowns of the equipment at peak-load when the temperature was in the 90's.

"As an example," says Homer Welch, chief engineer of the Monument Group buildings of GSA, "our office would receive repeated calls because the air conditioning system failed to operate satisfactorily. We had to do something and we turned to the larger capacity air-cooled units."

Maintenance costs of the old units were high, even when they were new, because of the extreme roof conditions, it was pointed out. The engineering department had to flood the evaporative condensers many times to keep them operating.

Formerly Cost $250 Per Year In Labor

Welch calculated that it cost over $250 per year—in labor alone—to keep each unit operating. He estimates that the new air-cooled condensers will only require two hours per year per unit for maintenance. This will include checking belts, oiling motors, cleaning coils, and washing down the units.

To further reduce maintenance and corrosion, Welch, who was responsible for the design of the installation, has specified aluminum cabinets on each of these new units. The casings of the condensers are supported by ¼-in. angle irons, are ruggedly reinforced, and cannot rattle or loosen. Special lock bolts assure vibration-proof, tamper-proof joints.

Although all of the condensers installed to date have been 15-ton units, Welch indicates that six additional 5-ton units will be installed.

These smaller units are to replace 5-ton evaporative condensers which service air conditioning units which are not located close enough to be grouped together, so that one air-cooled condenser could serve more than one system.

The packaged air conditioning units which are serviced by the new air-cooled condensers operate almost constantly because of the high Washington temperatures. Each packaged air conditioning unit services five to seven rooms, thus in a way, the system is a zone-controlled system.

It is a rare occasion during the summer that the thermostats take over the control of the units, because the heat load is so constant. Thermostats are located in the return air stream of each unit where they measure the air temperature returning from all of the areas which they supply. The thermostats control expansion valves on

Thank you, 74%

Good news! When we surveyed air-conditioning dealers in 21 cities last summer, we found that 74% knew of our Certification program. More important: 6 out of 10 familiar with the program *use it in their selling.*

Thus, in less than two years, air-conditioning dealers have demonstrated their enthusiasm for ARI certification. Many have thought up ingenious ways to sell with the program—and we're delighted.

But we won't rest on our laurels. Dealers kept telling us they'd like a sales piece that would explain the ARI Certification program to their customers, so we designed "How to Buy Central Air-Conditioning." It tells consumers the whys and hows of air conditioning, outlines the Certification program, suggests why air conditioning should not be bought on the basis of price alone. For a sample copy, write (on your letterhead, please) ARI.

AIR CONDITIONING AND REFRIGERATION INSTITUTE

Dept. A-1212, 1346 Connecticut Ave., N.W., Washington, D. C.

each individual packaged unit.

The equipment is designed for year-round operation and, in some windowless areas, they do run the year round. Says Welch:

"These installations are most satisfactory. It is a relief not to have someone running out constantly to see if the spray nozzle is stopped, if the water is working all right, and check on all the many details we had to keep up with with the evaporative condensers."

Another important feature of the air-cooled installation is the quietness of the belt-driven fans. This permitted the condensers to be placed on the ground alongside of the offices, with the assurance that no disturbing noise would filter inside. The condensers are of the horizontal discharge type and are placed so that the heat from the fans is blown back into the courtyard.

Welch says that the most significant feature of this installation is that the labor costs saved in maintenance should pay for the units within five years. In addition, it is no longer necessary for the maintenance crews to put up with the discomfort of working on the hot tar roofs.

To date, about 40% of the job of converting from evaporative type to air-cooled condensers is completed. The remainder of the job should be completed in early 1962. The air-cooled units already installed have operated throughout the summer of 1961 under peak load conditions very satisfactorily, it was reported.

143 Air Conditioning Permits Issued In Shreveport In October

SHREVEPORT, La.—During October, the city's Air Conditioning Dept. issued 143 permits for a total equipment and installation cost of $319,578, it was announced by Hugh Austin, air conditioning inspector.

This compares with 113 permits issued during September for installations costing a total of $548,886. The October permits were broken down as follows:

Residential: year-round air conditioninig and heating—19; air conditioning—2; heating—91; replacements—2.

Commercial: year-round air conditioning and heating—15; air conditioning—1; heating—4; replacements—1.

Alterations and/or additions—7; refrigeration—1.

Largest commercial permit of the month was issued to Mechanical Contractors for a $74,209 air conditioning and heating installation for Broadmoor Baptist church. Largest residential permit ($5,438) went to Arkansas-Louisiana Gas Co. for an air conditioning and heating project.

Inspection and surveys in October totaled 477.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Nylaflow Refrigerant Hose Claims Low Refrigerant-12 Effusion Rate

READING, Pa.—The Polymer Corp. has made available what it calls a "new, strong, flexible nylon hose with an extremely low Refrigerant-12 effusion rate."

The new product, trademarked "Nylaflow" refrigerant hose, "lost only ½ gram/foot of R-12 in the first seven days of testing with no subsequent losses, while rubber hose lost 6 gram/foot with continuing losses," the company stated. Losses with nylon hose are thus sharply reduced.

"Tests on R-22 show the losses with Nylaflow pressure hose to be 9 grams/foot in seven days, indicating its practical consideration for use with R-22 where organic hose was heretofore impractical.

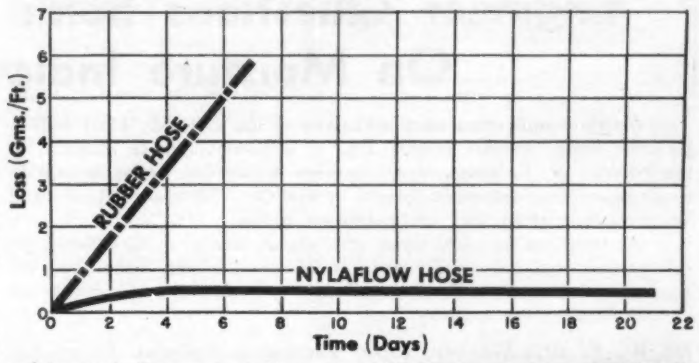
"Nylaflow refrigerant hose is a permanently bonded all nylon unit consisting of a special polyamide innertube with an overbraid of high tensile strength nylon cord and an abrasion resistant external nylon cover.

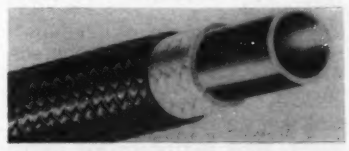
"The lightweight construction is approximately ⅕ the weight and has less than half the wall thickness of rubber hose of equivalent burst strength. The hose design also permits an exceptionally low bend radius and firm attachment of fittings.

"Field installations to date have verified test data on the hose's ability to contain refrigerants. Suggested uses include refrigerant lines on swing-out refrigerator units, automotive and bus air conditioners, truck refrigeration, and other equipment where flexibility or resistance to vibration is required."

The hose, rated at 4,000 psi minimum burst strength, is available in inside diameters of 3/16 in. through ¾ in.

Refrigerant-12 Effusion ½-In. Hose, 180°F





PERMANENT bonding of braid to inner-core and cover means smaller bend radii, more firm attachment of fittings with Nylaflow hose.

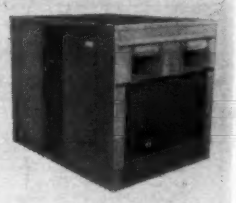
Madrid! Toledo! El Escorial! Seven glorious days under Spanish skies...sightseeing, dancing, wining, dining! Here's a sales incentive program that's easy to win! Typhoon counts tonnage ordered now and during the heavy selling season ...and you get a potful of sales aids, financing plans, and the broadest line of air conditioning units in the industry. "Reign in Spain" trips are just part of "Project Rainbow" — destined to make 1962 a pot-of-gold year for Typhoon dealers.

It's More Than A Line! Typhoon's 197 units for 1962 give you a full circle of air conditioners, heat pumps and furnaces. Everything you need to sell every customer — solve every problem — meet every need — through Typhoon flexibility.

TYPHOON
DIVISION OF HUPP Corporation

only a Typhoon dealer can REIGN IN SPAIN

Typhoon's Bill of Rights for Dealers! Something new in factory-dealer relationships. Every air conditioning dealer is entitled to it, but only Typhoon dealers are assured of receiving these benefits! **For more information** on the trip to Spain sales incentive program, Typhoon's complete line and a Reference Chart illustrating it, and Dealer Bill of Rights, call, write or use collect telegram.



8 Ton Roof Mounted Unit

WESTERN UNION TELEGRAM
Collect

Typhoon Air Conditioning Division,
Hupp Corporation Dept. 1-12-1
505 Carroll Street
Brooklyn, New York

Rush me full details on Typhoon's Bill of Rights and 1962 Program.

(your name and address)

Engineer Questions Some Statements On Moisture Indicators

Moisture indicators were discussed in the Oct. 30, 1961 NEWS by John Bopp, Ansul Chemical Co. In a communication directed to the NEWS, W. F. Wischmeyer, Sporlan Valve Co., takes exception to some of the statements made in the Oct. 30 issue article, and Wischmeyer's viewpoints are published below.

As we have already done with discussions over such things as refrigerants, cap tubes, service tools, air conditioning techniques, we again expose our readers to different viewpoints on a matter of significance to the industry.

By W. F. Wischmeyer, Chief Engineer, Sporlan Valve Co.

I have just finished reading a recent article in the NEWS on "Moisture Indicators." In general the article is well written and some very good points are made. Most engineers will agree that the drier the system the better but thought should also be given to practical and economical considerations. It is for this reason that I feel compelled to write you about certain statements that are made and which have been belabored for some time without anyone challenging their validity.

The article states that it is necessary to dry Refrigerant-22 systems to the range of 0 to 25 ppm. The author has been challenged on this point several times to provide more information substantiating his position or better yet provide experimental data supporting this claim. This information has yet to be released.

To my knowledge, no experimental data is available in the industry from which one could conclude that it is necessary to dry Refrigerant-12 to the level of 10 ppm. This is a generally accepted figure but it is based more on experience than test data, and it is my opinion that the figure is influenced more by the possibility of freeze-ups than the development of contaminants, corrosion, insulation deterioration. In this particular case I am willing to acknowledge that the experience far outweighs the experimental data and that the drying of Refrigerant-12 systems to this level is a reliable figure.

This is not the case in Refrigerant-22.

Cites Own Experience

I know from personal experience that there are many systems operating far in excess of 25 ppm and that satisfactory service has been obtained; that is, there has been no abnormal amount of compressor burnouts or system contamination. An effort was made several years ago to obtain factual data and viewpoints of various equipment manufacturers as to a "safe level" for Refrigerant-22. The data was meager and their opinions varied anywhere from 25 ppm to 150 ppm!

At this time based on published information, I do not think anyone can make the statement that Refrigerant-22 must be dried to 25 ppm. Until more factual data is available or experimental work concluded, we will have to go along with field experience.

In this respect consideration should be given to system design and sealed and semi-sealed compressor construction. It should be obvious that the insulating materials used in hermetic motors would be an important factor in establishing a "safe level" in Refrigerant-22 systems.

Need Not Indicated

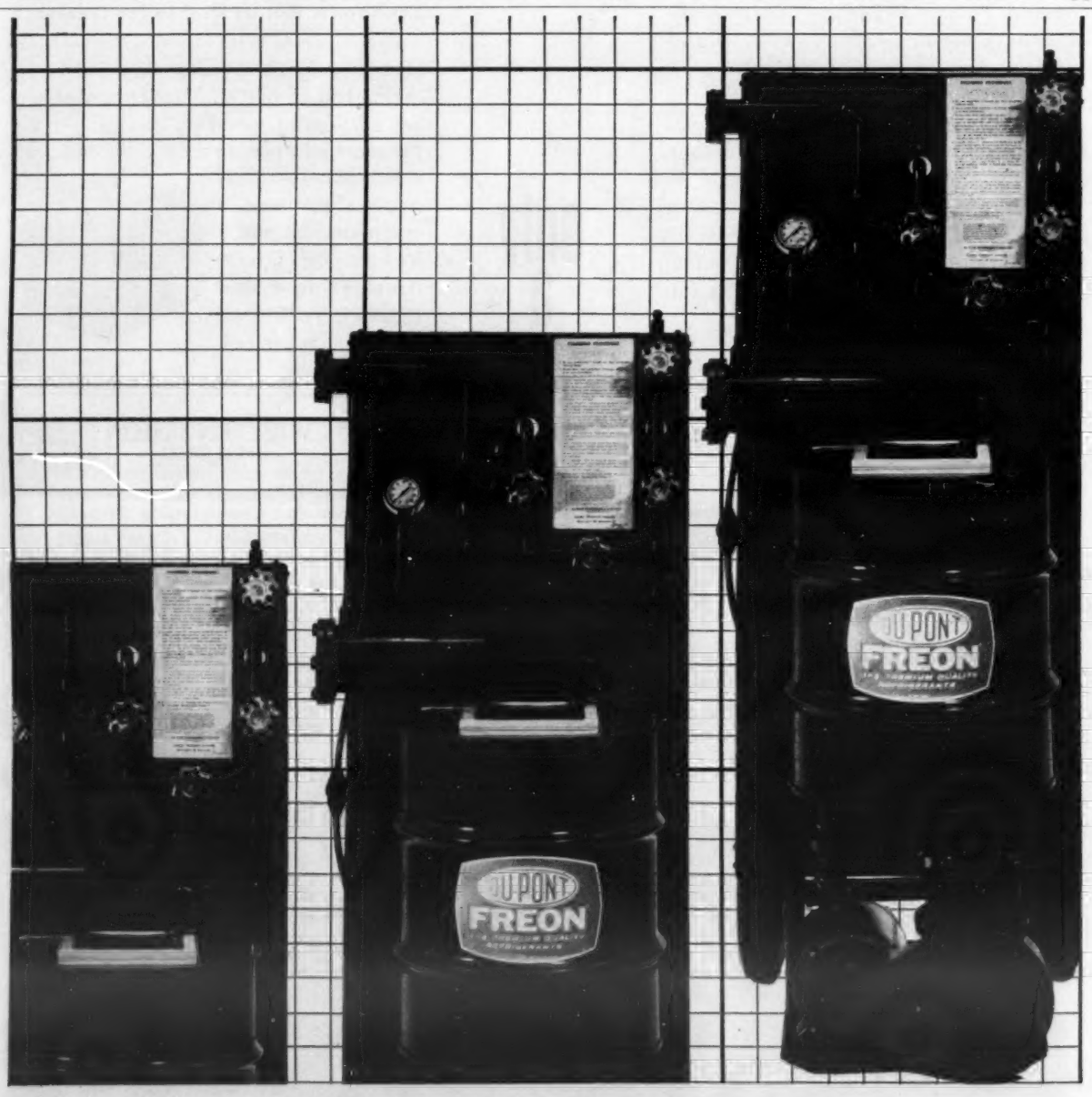
To further state that a separate and distinct moisture indicator is necessary for Refrigerant-22 is misleading.

There are several indicators available today which have been accurately calibrated for Refrigerants-12 and 22. Manufacturer's literature shows calibration in detail with temperature variation. The fact that a particular moisture indicator happens to be sensitive at low moisture levels on Refrigerant-22 does not justify the fact that Refrigerant-22 systems must be dried to this level.

We are far enough advanced in the art of moisture indicators that we have developed numerous indicators of various sensitivities. We too can supply an indicator which will have a very distinctive color changeover point at the 25 ppm level on Refrigerant-22.

As a point of interest, these indicators have been offered to several manufacturers who have declined to use them because they felt they were too sensitive and it was not necessary to dry Refrigerant-22 systems to this point of dryness. Again I state that I think this matter of system dryness is relative and is dependent upon equipment and compressor design.

In summation, I take exception to statements made by technical people establishing guide points in the industry which are not based on experimental data or reliable field test data. I challenge the author to substantiate why *all* Refrigerant-22 systems should be dried to the range of 0 to 25 ppm.



RAISE PROFITS

with this new Du Pont power-cleaning unit for burnouts

You can prevent costly call-backs on refrigeration burnouts—just use this new portable unit designed by Du Pont. It does a fast, thorough first-time cleaning, by complete pressurized recirculation. And it uses Freon-11*, the most effective, selective solvent available for oil and grease.

When you recharge the system, Du Pont's improved light-weight "Zephyr" cylinders make that job a lot easier too. Both the burnout unit and the "Zephyr" can increase your profits and your reputation for good service. Ask your local air conditioning and refrigeration wholesaler who sells "Freon" for details.

*FREON and F- followed by numerals are Du Pont's registered trademarks for its fluorocarbon compounds. **Patent Applied For

Another help on burnouts is Du Pont's new Acidity Test Paper**. It tells you quickly and surely when the solvent in your hermetic burnout unit has become too acid for use. See your wholesaler for more details.

FREON® premium quality REFRIGERANTS

DU PONT

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

...center of importance in DETROIT

- 800 fine rooms with bath, radio, TV
- Grenadier Dining Room and Lounge
- Coffee Shop
- Convention Facilities
- Ample Parking

Gordon N. Taylor
Gen. Mgr.

DETROIT LELAND HOTEL
CASS AVE. AT BAGLEY
DOWNTOWN DETROIT 26, MICHIGAN

National Electric Comfort Heating Exposition Exhibit Policy Announced

NEW YORK CITY—An exhibit policy for the second National Electric Comfort Heating Exposition to be held March 19-21 at the Hotel Sherman in Chicago has been established by the Exposition Committee, it was announced recently.

The announcement said that "types of equipment, accessories, and the like that truly represent the industry will be on display." It said the products to be displayed will cover:

1. Residential, commercial, industrial direct resistance comfort heating equipment of the following types:

a. Wire and cable units for installation as radiant heating systems.

b. Radiant heaters either of glass, tube, rod, ceramic, metal or other material, self-contained automatic or manual control, with or without integral component motors, thermostats, or other accessories.

c. Wall or ceiling heaters, convection type, natural or fan forced, self-contained automatic or manual control.

d. Floor-standing heaters which are adaptations of products described in items b and c which are suitable for operation at voltages in excess of 200 volts.

e. Central electric heating systems, both floor and central types, self-contained.

f. Baseboard heaters, self-contained automatic or manual control.

g. Duct heaters consisting of an electric heating element or elements mounted in an open metal frame and designed to be inserted in ductwork.

h. Electric steam radiators.

i. Accessories for all of the above, such as end caps, fittings, dividers, connectors, blank baseboard sections, etc.

2. Heat pumps—room and central only if combined with electric heating.

3. Insulation and insulation equipment.

4. Controls — timers — cut-outs, thermostats, humidistats.

A fifth category includes trade press and trade associations.

As at the first exposition held last year, a symposium will be conducted in connection with the show. The sponsor is the Electric Comfort Heating Equipment section of the National Electrical Manufacturers Assn. The symposium's theme will be: "Sell Electric Comfort Heating Cooperatively."

Supervising preparations for the programs of the general sessions and seminars is R. D. Graham, general manager for electric resistance comfort heating, General Electric Co. He is general chairman of the exposition.

Registration will admit the registrant to all general sessions, seminars, exhibits, and the industry luncheon on Tuesday, March 20. Advance registration is $20; at the hotel it will be $25. Daily registrations will be offered at $6 for Monday, $15 for Tuesday, and $8 for Wednesday.

The exhibit will be open from 10 a.m. to 1 p.m. and from 3 p.m. to 7 p.m. on Monday; from 11 a.m. til noon and from 3 p.m. to 9 p.m. on Tuesday; and from 9 a.m. to noon on Wednesday.

Plans are being made for a guided tour of Chicago's new Marina City, believed to be the world's largest electric heating installation.

Award Winning Home Has Silver Shield Heat

LANSING, Mich. — A spotlight was focused on Silver Shield recently when the Mid-Michigan chapter of the American Institute of Architects convened here for its first annual honor awards program, it was reported.

Winning the recognition for Silver Shield was the Crouse residence, designed by John Crouse, Jr., of the architectural firm of Mayotte & Webb. The residence, in the $100,00 class, is located in one of Lansing's most exclusive real estate developments.

A 12-room, five-level, modern brick structure, the award-winning home has a heating installation that features two furnaces.

"One operates continuously to provide partial heat for the entire house," said Ron Fitzpatrick, of the Winkler Heating & Air Conditioning Co. and designer of the heating installation. "The other," he added, "is only in operation when maximum comfort and total usage is desired.

"This heating layout was so carefully planned that a person could walk barefooted in complete comfort over the polished brick floors of the main portion of the house," Fitzpatrick explained.

Fitzpatrick is president of Lansing's Silver Shield Indoor Comfort Bureau.

Ohio Group Seeks Lower Electric Power Rates

NORTH BALTIMORE, Ohio —Members of the Hancock-Wood Electric Cooperative, Inc., at their annual meeting in Findlay, passed a resolution urging that the power suppliers of Ohio "undertake joint studies which will lead to getting the price of electric power for residential, farm, and church use down to an average of no more than 1½ cents per kwh sold."

It was suggested that this goal should be reached within five years. If it is not, the resolution said, "then the co-ops should proceed at once to build and operate their own system to try to reach this goal of low priced power for Ohio on their own."

Hancock-Wood's average price per kwh is 2 cents currently, it was noted.

MIGHTY MITE MOTOR PROTECTORS

ADD DEPENDABILITY AND SAFETY TO APPLIANCES WITH MIGHTY MITE

MECHANICAL INDUSTRIES PRODUCTION CO.
223 Ash Street Akron, Ohio
SAA 3395/84C

Make this your year to take on a better heating/cooling line . . .

A Lennox dealership offers not only profit... but prestige too

There's a special air of importance that goes to the man who handles the largest selling line in his field

He looks successful because he *is!* And in the case of the Lennox dealer, his townspeople think of him—not so much as a seller of products—but as an *expert* in the science of indoor comfort.

While you're thinking about your own business future, imagine YOU are that man. Then you'd be handling America's number one brand. You'd have a complete line of heating and air conditioning equipment with an accepted reputation for quality. You'd have more customer benefits to talk about. You'd be in close personal contact with factory personnel—with a highly trained field force at your disposal. The industry's finest sales and technical schools would be available to your men, too.

But there's so much more to tell—why not get the whole, wonderful story? Write your nearest Lennox factory or Lennox, 416 S. 12th Ave., Marshalltown, Iowa. No obligation.

You get more sales help from Lennox

Within the covers of the giant Lennox Marketing Handbook are the many materials, ideas and "how-to" information for all types of advertising and sales promotion programs. There are "automatic" plans (no fuss or work on your part) and the hottest radio deal in the industry tying in with Lennox' coast-to-coast Weather News program featuring John Cameron Swayze.

Don't be satisfied with less than

LENNOX

HEATS, COOLS, TREATS AND MOVES AIR

IN HOMES IN CHURCHES IN SCHOOLS IN COMMERCE

LENNOX Industries Inc., est. 1895—Marshalltown, Des Moines, Ia.; Columbus, O.; Syracuse, N.Y.; Decatur, Ga.; Ft. Worth, Tex.; Salt Lake City, Utah; Los Angeles, Calif. LENNOX Industries (Canada) Ltd.—Toronto, Montreal, Calgary, Vancouver, Winnipeg

Perfection Letter Contest Winner Gets Free Mexican Trip—With Bullfights

RONALD S. MORSE (second from right), Gateway Heating & Air Conditioning, Jacksonville, Fla., receives notice that his letter has copped first award and a trip to Mexico in the Perfectionist Air Conditioning Contest. Others in the photo, left to right, are: H. L. McMurry, owner of H. L. McMurry Co., Jacksonville-Tampa Perfection distributor; Frank Williford, Gateway owner; and Harry O. Kimball, McMurry sales manager and supervisor of the Gateway account.

CLEVELAND — Ronald S. Morse, Gateway Heating & Air Conditioning, Jacksonville, Fla., combined business with bullfights during the week of Nov. 27 as a result of his winning entry in the Perfectionist Air Conditioning-Heat Pump Contest.

The contest award, sponsored by Perfection Div., Hupp Corp., was a free trip to Mexico in conjunction with the firm's sales meeting held there at that time. Morse joined 300 other Perfection dealers, distributors, and their wives at the meetings in Mexico City and Acapulco.

The contest grew out of the many letters Perfection had received from dealers and distributors telling of their successful relations with the company and how the products helped build a sound, profitable business, it was pointed out.

Entries, in the form of letters stating why being a "Perfectionist" helped accomplish these ends, were submitted to a panel of judges consisting of editors and publisher of trade publications in the air conditioning field. Morse's letter stated:

Winning Letter

"I am proud of being a PERFECTIONIST because the selling and proper installation of PERFECTION AIR CONDITIONING AND HEAT PUMPS has really helped me build a sound, profitable business and gain a fine reputation for providing the maximum in comfort at a surprisingly low operating cost.

"While most of Jacksonville is suffering from high electrical costs, my customers are enjoying the comfort of year-round PERFECTION AIR CONDITIONING for the mere cost of a pack of king-size cigarettes per day.

"By adhering very close to the principles of design of National Warm Air Heating & Air Conditioning Association and installing PERFECTION AIR CONDITIONING AND HEAT PUMPS according to specifications, GATEWAY HEATING & AIR CONDITIONING has never had a service call during the warranty period on PERFECTION equipment which could be attributed to a malfunction of equipment or inefficient duct design.

"These two factors: (1) lower operational costs, and (2) lower maintenance costs of PERFECTION AIR CONDITIONING AND HEAT PUMPS have helped me to sell and install more equipment and realize greater profits.

"I have found it not always wise to design around price alone, but to deliver the most economical operating system possible. Most jobs that are priced 25% less than the median are up to 50% higher in operating and maintenance costs; by using PERFECTION equipment the user will more than realize his savings in less than a year. The term PERFECTIONIST soon becomes synonymous with ECONOMIST in the mind of the customer."

Other Winning Entrants

Other prize-winning entrants in the contest walked off with awards ranging from movie cameras to special editions of the inspirational book, "The Art of Living."

Second prize was won by C. J. Tidwell, Tidwell Electric Co., Nashville, Tenn. Don Hammond, Hammond Heating & Air Conditioning Co., Jacksonville, Fla., was third. Fourth prize was copped by Leland Chapman, Chapman Plumbing & Heating Co., Fort Worth, Texas, and fifth place honors went to H. B. Stroup, Jr. of Stroup Sheet Metal Works, Asheville, N. C.

"The general content of the letters showed that dealers were unanimous on rejecting 'strictly price' as the magic solution to selling problems," Perfection noted. "Almost to a man, the theme of the letters praised products which would make customers happy through lower operational costs and leave the dealer's profit margin intact through less maintenance and service callbacks."

"Here's why I standardized on H&M cooling towers

...they're the only towers with a 20-Year Guarantee on the wetted deck surface!

"In my town, most air conditioning and refrigeration buyers prefer cooling towers for their installations. But local water conditions are pretty hard on the fill. Fungus and algae grow fast and furious—so fast that the accumulation actually blocks air flow and cuts tower capacity!

"After trying several makes, I standardized on H&M Cooling Towers. *The wood fill is specially treated with creosote applied under pressure,* and water plants and animals can't live on that! That's why the Halstead & Mitchell towers carry a 20-Year Guarantee on the wetted deck against failure due to fungus attack or rotting."

If you want towers that will last, and need a minimum of care, you should find out about H&M towers. Call your local parts wholesaler or write for Bulletin EC-500 (Propeller Fan Towers, 3 to 150 tons) or Bulletin ECKB-601 (Centrifugal Fan Towers, 5 to 30 tons). Halstead & Mitchell Co., Dept. H122 Bessemer Building, Pittsburgh 22, Pa.

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Export Representatives: Sabal-Kielmann, Inc., 15 William St., New York 5, N. Y.

ASHRAE So. Dakota Chapter Chartered

SIOUX FALLS, S. D. — A charter was presented to the newly-formed South Dakota Chapter of the American Society of Heating, Refrigerating & Air-Conditioning Engineers by John E. Everetts, Jr., national president, at a meeting held here recently.

The chapter is the 91st in the nation. Officers are Melvin Bird, chairman of the board; Ralph Larson, president; John Sandfort, vice president; Dave Rosenstein, assistant vice president; John Mahanna, secretary; Bill Menzel, assistant secretary; and Fred Monick, treasurer.

TECH CENTER

by FRANK J. VERSAGI

TESTING LABORATORIES:

Underwriters' Laboratories (2)

This is one of a series of articles discussing testing laboratories of several types. Due to increased activity with certification programs, complaints about delays in safety and performance testing, and repeated suggestions that the heating-cooling industry should set up its own independent testing laboratory, NEWS readers have requested an analysis of the role that existing laboratories are playing in the heating-cooling industry.

FOLLOWING a brief background on the Underwriters' Laboratories, last week's instalment began presenting UL's answers to questions relative to complaints about its operation. We continue these questions.

May we turn to the subject of time required for testing? Probably the most frequent complaint we get is that UL takes too long to complete a test. Several things occur when this happens. Manufacturers feel compelled to move their products to market before the listing has been received; some inspection authorities refuse to allow installation of such equipment; others insist upon separate testing which must then be paid for by somebody. How long does a test take and why?

Average total elapsed time for testing and reporting on central air conditioners and heat pump is eight weeks; comparable time for room units is three or four weeks.

How much of this time is involved in the actual physical testing on a central unit?

About a week of actual testing time is involved. The rest of the time is used up in processing the original application, getting the unit in, working with the electrical department on such things as control panels.

There is another side to the story that delays in our facilities force a manufacturer to go to market without the listing; we have been able to determine, in a few instances, that some manufacturers have gone directly to market, told inspection authorities that UL was behind schedule on supplying the listing, when the manufacturer had not applied for a listing at all.

Also, in addition to submitting an application form, a manufacturer is required to supply information on the construction and features of his unit and to submit test samples. There have been instances when only the paper application was sent in and weeks went by before the unit arrived for test. In one instance, months went by without correspondence or any activity on the part of the client. Yet, he complained that the testing took too long because he counted the time from the original submission of his application alone.

The actual tests are conducted on a first-come, first-serve basis—in order of receipt of full application and equipment.

The NEWS recently carried a story stating that you had increased your testing facilities for air conditioners.

Yes, it has become necessary for us to increase these facilities. Further, I think it is significant that the casualty and automotive department has increased from 5 to 27 engineers in about eight years.

This brings up another point: we frequently hear complaints that your personnel are not as professional as they might or should be to perform the functions properly.

I believe that 11 of our department engineers are registered professional engineers. Like industry, we have difficulty in acquiring and retaining competent technical personnel. But I do not feel there is any need to apologize for the caliber of the work performed.

What about those in the field — the factory inspection group?

These people are stationed in inspection centers around the country. It is their function to enter plants to determine that current production is in line with characteristics listed in the original inspection report. Our inspectors can make no engineering decision; if he finds a change, he must notify the appropriate engineering department, which then investigates.

Remember that we, Underwriters' Laboratories, do not operate in a vacuum. We maintain active liaison with the industry and with inspection authorities. Our industry advisory conferences, for example, are made up of representatives from manufacturers. If changes are suggested in our requirements—either due to new designs or re-evaluation of past requirements — the proposed change is submitted to this industry advisory group.

After the Industry Advisory Conference has had an opportunity to comment, the proposals are then sent to the manufacturers and pertinent councils by bulletin. When everyone interested has had a chance to comment, the UL reaches a final decision.

Suppose a single manufacturer or two object to adoption of the change?

If the item is technical in nature and is of sufficient importance, it may be referred to the National Bureau of Standards as a final arbiter.

Will UL Accept Its Own Listings?

Will Underwriters' Laboratories accept its own listing on a component, such as a control box, when this component is installed on unitary equipment?

Yes, in fact, this is one way to expedite the listing of unitary equipment.

We have had complaints, however, that a control panel listed by you, has not been accepted when it has been installed on unitary equipment.

This has happened in a few cases. In such instances, we have felt that the component was applied under conditions which exceeded the criteria considered in the original examination of the component alone.

Along these lines, it is interesting to recall that in the early days, contacters, starters, relays, were submitted by the manufacturer and listed for general application. Now, tailor-made components must be tested in combination with their units, since they do not reach the market as general purpose components.

When this happens, of course, such a component cannot be listed independently, although it may be recognized for its limited application.

What sort of tests do you run on air conditioners?

Such things as short circuit tests on motor protection, 15-day locked rotor tests, winding and insulation temperatures, pressure buildup. Presently there is great interest in the new internal overload protective devices, and we have recently investigated many.

One last question: we have heard reports that UL approved an electric coffee pot for safety, although the coffee pot would not make coffee.

Mr. Merwin Brandon, our president, recalls that we did refuse to list an electric coffee pot because it would not make coffee. Our position is that the device or equipment must perform its intended function in order to be eligible for listing. We do not wish to be a party to a fraud on the public.

Generally speaking, however, we do not test the efficiency of a device except as efficiency may be related to safety.

I would like to add that much of the misunderstanding about Underwriters' Laboratories function seems due to a failure to understand the routine by which we operate. Frequently, we feel a manufacturer or his contact engineer may feel that something is amiss. But unless they come to us and discuss the situation, time passes with nothing being accomplished.

Pope felt it would be inappropriate for him to comment on industry suggestions for setting up its own laboratory. From the general tone of the conversation, however, the NEWS sensed that he agreed with other authorities who feel that the great expenditure of time and money which go into setting up a laboratory preclude creating one with a snap of the fingers.

There is also the added problem, in safety testing, of having a new laboratory's listings accepted by industry at large, local inspection authorities, and the public.

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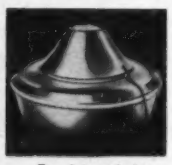

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6. Variety of mounting brackets.

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Type 83 — Series type motor starting relay used for single phase motors with phase winding currents to 25 amps at 115 volts and 15 amps at 230 volts. Max. coil pick-up 30 amps. Typical applications are under-the-counter appliance motors and heavy duty single phase motors.

Type 84 — General Purpose single pole switching relay. Typical applications—heating and air conditioning switching relays, fan relays, appliance relays, office machines, photo-electric controls and general purpose switching. Consult factory for higher resistive and inductive ratings available for special applications. Coils to 240 volts.

Contact Ratings	12 amp resistive — 125/250 volts 8 amp inductive — 125/250 volts	Pilot Duty	3 amps — 125 volts. 1½ amps — 250 volts.

For full engineering data consult your local RBM Product Application Engineer or Write for Bulletin 1080.

RBM Controls Division
LOGANSPORT, INDIANA

RICHARD M. HERBERT, Heil-Quaker chief engineer for air conditioning, explains operation of console to John Reed, laboratory technician.

Heil-Quaker Expands Laboratory Facilities

Testing laboratories are in the NEWS. While Tech Center is discussing independent commercial testing laboratories, manufacturers are adding to and improving their own testing facilities. Here is a case in point.

* * *

NASHVILLE, Tenn. — Heil-Quaker Corp. has constructed extensive laboratory facilities for the development and test of residential air conditioning units, to supplement existing facilities, "which provide complete AGA and UL tests for heating equipment."

Novel Features

The laboratory incorporates several novel features which provide increased accuracy of the test work as well as reducing the personnel requirement for operation, according to Richard M. Herbert, chief engineer for air conditioning, who designed and supervised the erection of the laboratory. Herbert explains that the test chambers, separated into "inside" and "outside" rooms by an insulated, movable partition, are located over a 4-ft well which provides the space for the "wet" operations used in connection with the tests.

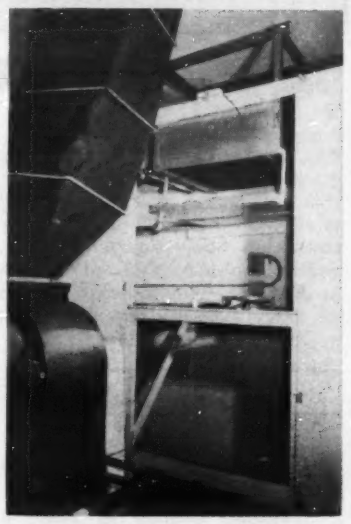
Four 3-ton package water-cooled water chillers feeding chilled water to an insulated storage tank, circulating pumps, and a cooling tower sump tank are located in the well. The tower, located on the roof deck operates with a dry sump for all weather operation. The entrance to the test chambers and all operating controls are located on the main floor level.

Heat Source

Locally fabricated electric resistance heaters installed behind a mixing chamber partition in the "inside" room provide the heat source to the air entering the main test chamber. Directly beneath the heater section a 3-section low water volume electric humidifier is installed in the warm air path. Control on both the heating and humidifier sections is established through step switching and variable resistances located at the central control panel from which the operator can continuously vary the inputs from 0 to full capacity.

The humidifier is capable of vaporizing 30 lbs of water per hour and is pulse fed at the rate of .287 lbs per pulse. Level control is maintained through an electronic relay - amplifier controlling a cam operated switching circuit. Feed water pulses are recorded on a counter on the main panel.

The "inside" room is main-



MIXING CHAMBER with cooling coil and circulator. Balance blower of tunnel is in foreground.

EXTENDING THE KLIXON SPECTRUM OF MOTOR PROTECTION

NOW... FULL BURNOUT PROTECTION FOR SMALL COMPRESSOR UNITS!

New KLIXON 7896 all-welded hermetic protector fits into windings of ½ to 2 hp single-phase motors!

This hermetically sealed, tubular protector extends the KLIXON Spectrum of Motor Protection to window air conditioners and heat pumps. It safeguards them against motor burnout . . . completely and economically.

Responsive to both current and temperature, the KLIXON 7896 prevents overheating over the widest range of ambient, voltage and running variables. Mounted directly on the motor windings . . . or within them . . . it's located at the heart of the burnout problem. So, it senses what's going on inside more accurately than external protectors . . . and responds before damage is done.

Two seals bar refrigerant! The KLIXON 7896 has a glass-to-metal hermetic seal in the header . . . and the header is welded to the tubular can. Result? Its leakage rate is less than 1 x 10 $^{-9}$cc per sec at one atmosphere differential. That's about 0.623cc in 20 years.

Design simplicity assures long-lived accuracy! The KLIXON 7896 is the simplest device in the small-size class. It has only one moving part . . . the famous KLIXON snap-acting disc . . . reliability-proved in more than 200,000,000 motors. NO springs, screws or sleeves to complicate calibration and encourage wear.

Quality control procedures are stringent! Five 100% tests of components and assemblies plus statistical test sampling of each 100% check group guard reliability all along the line. A final 2% destructive mass spectrometer leak test makes sure that you're getting a protector that can be safely sealed within any motor-compressor unit.

Play it safe! Specify KLIXON 7896 Motor Protectors for your next small motor-compressor units . . . and get a sales feature that will give you the competitive edge. Bulletin DD-MOPR-18 gives you all the facts. Write for it today.

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- ☐ **Estimator's Heating, Plumbing, and Air-Conditioning Manhour Manual,** by John S. Page. $7.50
- ☐ **Estimator's Piping Manhour Manual,** by Page and Nation. $7.50
- ☐ **Manual J—Load Calculation,** by National Warm Air Heating & Air Conditioning Assn. $2.50
- ☐ **Principles of Refrigeration,** by Roy J. Dossat. $11.50
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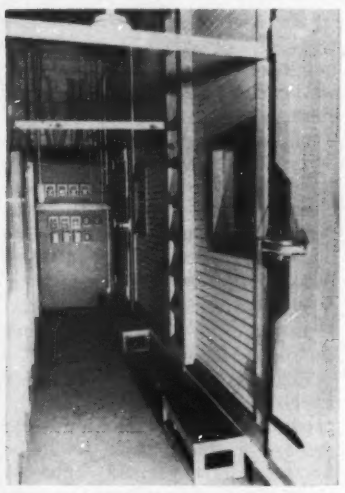


FRONT VIEW of test rooms showing observation windows.

tained at proper temperatures and humidities required to simulate conditions in an air conditioned home and can be varied from 70°F upward. Relative humidity can be controlled at 20% or above. To aid in close control for small capacity units a chilled water coil is also used in the mixed air stream.

The "outside" test chamber cooling coils are supplied with chilled water from the storage tank through a remotely controlled motor actuated flow valve. "To provide infinite variability," the chillers are operated continuously and the temperature of the supply water from the tank is controlled by reheating elements operating through variable resistors on the control panel. Flow through the heat transfer coil may be readily reversed for better dewpoint control. Conditions in this room simulate outdoor temperatures to 125°.

Continuous Air Circulation Maintained

Continuous air circulation is maintained in each room to insure uniform mixing, and 1½° gradients or better are obtained.

Temperatures for ratings are obtained from ⅒° mercury thermometers and component temperatures may be read on a precision indicator or printed on a strip chart recorder at the operator's option. The thermocouple switching circuits allow for grid-temperature setups without complicated wiring changes.

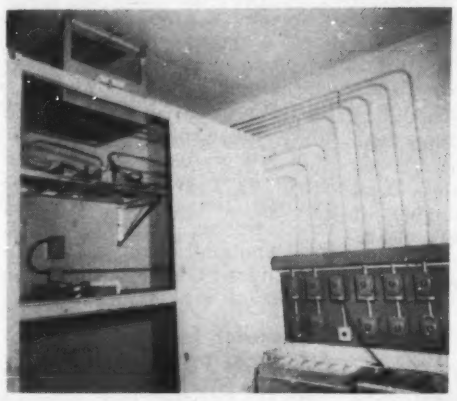
Air volumes are obtained by the use of ASME orifices installed in a portable tunnel, where the air is thoroughly mixed to provide maximum accuracy of the samples. Control of the primary air supply as well as the balancing fan is obtained by the use of linear actuators adjustable from the operator's position.

A 48-in. inclined manometer indicates pressure drop across the orifice and all air measurements are corrected for density and barometric pressure. Other manometers measure tunnel balance and miscellaneous pressure drops.

Electrical service is supplied from a separate delta-connected transformer at 240 volts which may be adjusted to any value from 0 to 280 volts. Single or three-phase power may be obtained from the circuit and measurements of voltage, current, and watts are instantaneous. Meter switching is accomplished at the control panel as well as is meter range control. All electrical instruments provide accuracy of ½ of 1%.

Measurement of Pressures Is Unique Feature

"Perhaps one of the most unique features of the laboratory is the measurement of pressures," said Herbert. Transducers translate the pressure signals to a millivolt output that is read directly on a specially scaled self-balancing potentiometer. The full pressure ranges of the transducers 0-200 psig and 0-500 psig are read on a 28-in. expanded scale thus reducing reading errors. "Loss of refrigerant, friction losses, and inaccuracies normally introduced by liquid condensation in gauge lines are avoided in this method of pressure measurement."



REHEAT and humidification equipment for "inside" design room.

The complete installation, designed to test air, water, or evaporatively cooled units to 7½-ton capacity, is completely under control within .1° from the operating station. To obtain maximum accuracy, manual control is utilized; however, by proper switch settings automatic operation may be used for "soak-out" or protracted overload tests. Simultaneous ratings by "heat-balance" and "psychrometric" means fully comply with requirements of ARI and other rating agencies, the company reports.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Leo W. Hahn Named Director of Emerson And Quiet Kool Sales

JERSEY CITY, N. J.—The appointment of Leo W. Hahn to the position of director of Emerson and Quiet Kool Div. sales for Emerson Radio, Inc., was announced by Benjamin Abrams, president.

Hahn succeeds Arnold Henderson who has resigned to take a position with a firm in a non-competitive field.

Joining Emerson in 1945 as administrative assistant to the vice president in charge of sales, Hahn advanced to premium sales manager in 1950 and became northeast regional sales manager in 1954. In April, 1958, he was promoted to field sales manager, a post which he has held until assuming his new duties as director of sales.

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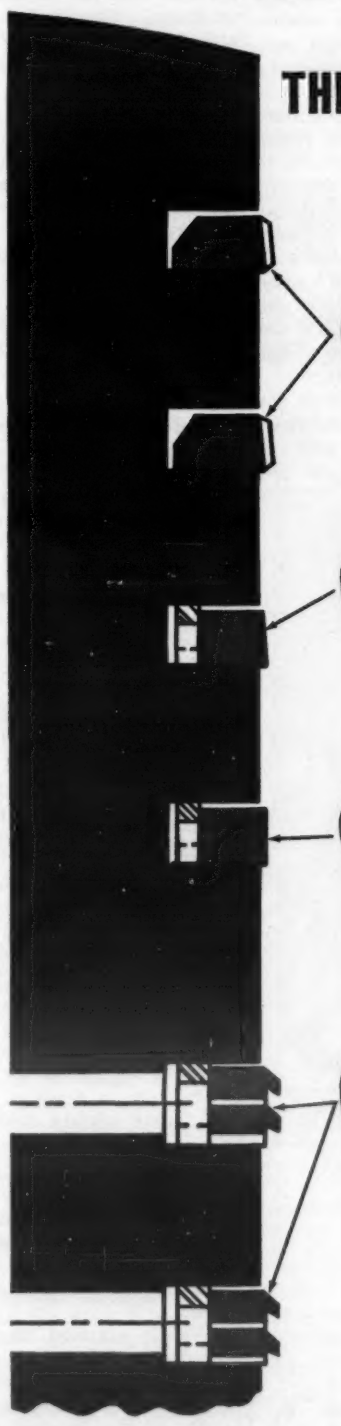

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Taper face conformable compression ring with "equalizer" spring to supplement gas pressure and assure positive cylinder wall contact. Provides positive sealing action and long life.

Sealcut conformable compression ring with "equalizer" spring gives added help to gas pressure for positive sealing against cylinder wall. Blowby is reduced to minimum, results in less crankcase contamination.

Formflex oil control rings with "equalizer" spring achieve maximum conformability . . . provide uniform oil distribution . . . reduce ring and cylinder wear.

This is a typical installation of Pedrick conformable rings in a 4-cycle engine. Other type compression and oil rings are available for a wide range of industrial and motive power uses. If you have a ring application problem, or need a special ring, write the Pedrick Engineering Department for prompt attention.

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15th Annual NHAW Convention--

(Continued from Page 1)

two out of five wholesalers are seriously affected by it, particularly in small ticket items. Such competition is also cutting into furnace sales to a certain degree and even slightly into central air conditioning.

● Inauguration of Hesling as president and selection of George Primich of Gary, Ind., as president elect.

Garrett admitted that the past year has been a rough one for heating wholesalers and there had been a number of casualties in the ranks. However, he indicated that despite this, NHAW experienced a substantial increase in membership. The association now has about 450 members.

"While we are now in an encouragingly expanding market," Garrett declared, "the road ahead for wholesaling will not be a bed of roses. We continue to be in a never-ending fight against the competition of direct selling, of pseudo short line wholesalers, of cash and carry no service houses, and the specter of ever rising costs.

Wholesaler In Other Area Is Paying for Direct Distribution

"We must continue to realize that the manufacturer who sells through wholesalers in one area of the country and direct to the trade in other areas without recognizing the wholesale functional cost is requiring our wholesalers to subsidize their direct distribution.

"We must appreciate and patronize the supplier who knows the fundamental concept in distribution that the wholesale function and its costs may be shifted but can never be eliminated."

Hesling, from the Climate Distributing Co. in Van Nuys, reiterated these sentiments in his inaugural address, stating:

"We need closer cooperation and coordination with our suppliers. We need to give full support to the suppliers with good distribution policies who at all times and in all areas of the continent recognize the wholesale function and its costs.

"You need to be aware of the supplier with an opportunistic distribution policy who will sell to anyone, at any time, at any price, and then jerk the rug out from under you at his convenience after you have established his distribution in the area.

"In keeping with our thinking on a fair distribution policy to wholesalers, I visualize the long range policy of this association being one which will give broad distribution to those suppliers who have good distribution policies and to let the other suppliers go direct not only where they find it convenient, but everywhere.

"We would have no problem competing with this type of direct selling if they had to face up to a complicated sales force, credit problems, warehousing problems, service, and all other functions performed by the wholesaler.

"I can assure you that we will carry on a dynamic program during my administration for all the people operating in the industry, wholesaling in general, for the elimination of unethical distribution policies and for your support in cooperation with the manufacturers who support and work with us."

When asked during a discussion of discount house merchandising and competition whether manufacturers can justify selling to both old line wholesalers and to discount houses, both manufacturer members of the panel said they could.

Manufacturers Tell Why They Sell Through Discount Houses

F. Robert Walker of American Air Filter Co. pointed out that such dual distribution has been going on for a long time. The fact that it exists and survives justifies it, he indicated.

He noted that the type of product involved has a great deal to do with the manner in which it is distributed. Low ticket items that can be sold over the counter—such as furnace filters — can be sold through discount houses.

Walker also pointed out that discount houses often give the manufacturer distribution he could not afford otherwise. Thriving discount houses are often located on the highways, out away from the central business district, and tapping small town and rural trade for 50 miles around that wholesalers or even dealers aren't getting.

V. J. Heinis of Rheem Mfg. Co. agreed and added that one cannot tell the furnace manufacturer who is not getting sufficient volume through standard wholesale outlets that he cannot sell through other means of distribution if he deems it necessary to cover his market.

He cannot be told that he must go out of business just because he can't sell his product through the heating wholesaler.

Heinis claimed that, in the plumbing field, which is hard hit by discount house competition, plumbing contractors sold 69% of the market last year, their greatest penetration in history. The mail order house is their biggest competition, he said.

Victor Prince, a wholesaler from Springfield, Ohio, commented that the wholesaler doesn't have to condone this dual distribution, just because it is possible.

"We should do what we think is right," he said.

Prince also advised his fellow wholesalers not to kid themselves that discount houses were selling shoddy merchandise. The larger ones, he noted, are selling just as good merchandise as is available to regular wholesalers. They have the buying power to command quality merchandise.

What can the heating wholesaler and his dealer customers do about this?

Both Heinis and Walker agreed that knowledge of the product is the wholesaler's and dealer's greatest asset. Let it be known, they advised, that at their place of business, the public can get what they want. And if they don't know exactly what they want, they can get expert help to solve their problems. Friendliness is your biggest selling tool.

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Here's good news for both distributors and contractors! No need now to stock a lot of thermostats for replacement service on hot-air systems. This new KLIXON Star Line SL-4 Kit meets most requirements with only 6 assorted fan switches, 3 assorted hi-limit controls and 13 assorted interchangeable mounting flanges. Supplemental pieces available separately for kit replenishment or special temperature ranges. Replacement chart on inside cover of kit simplifies identification. Easier ordering, smaller inventory, speedier servicing! Distributors wanted. Write for complete information today!

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Scott Publications, in a study of discount house operations, found that discount house prices on air conditioning and heating equipment are still above the wholesaler's and not a serious threat—pricewise—to heating and cooling contractors.

Bob Allen of Atlas Supply Co., Winston-Salem, N. C., suggested that the wholesaler "appreciate" the dealer, and sell him to the public. Make the public believe that it can get comfort from dealers that they can't get from discount houses. Then, Allen said, "we'll get our business back."

Allen, who is chairman of NHAW's air conditioning committee, reported to the committee that such a program is being tried now in Winston-Salem.

Known as "Operation SWAP," it is sponsored by the Southern Wholesalers Association and aims at telling the public through a saturation advertising campaign, what the home modernization contractor can do for them.

Through some 52 newspaper advertisements and 720 radio spots, plus television and other media, the program will "glorify the image of the plumbing, heating, cooling contractor as 'Mr. Modern' with sleeves rolled up and ready to go to work."

Planned advertisements will promote the benefits of modern cooling and heating equipment as well as the contractor.

At its meeting, the air conditioning committee was brought up to date on changes in the five-year warranty made by some manufacturers and heard discussion among heating wholesalers that charged tubing was not the cure-all to their problem of getting the heating dealer into the air conditioning business.

Use of charged tubing still requires a competent refrigeration mechanic who must follow the same procedures of installation as when installing a system that is not pre-charged, the wholesalers testified.

F. S. Donnelly, Jr. of the Armstrong Cork Co. advised the wholesalers that their major sales problem was not "if" they can sell, but "how" they can sell under conditions as they are.

The wholesaler has a legitimate role to play in the distribution of goods, he noted, and they have several important factors working in their favor. These include keener retail competition that emphasizes the turnover rate and higher freight rates.

The wholesaler becomes essential Donnelly observed, when he serves his source of supply and his customer equally well and performs his task more efficiently than any other means.

A panel discussion of market analysis brought out that only 31% of NHAW wholesalers engage in market analysis themselves and only 13% use the services of an outside organization to get this information.

Forty percent of them felt that market analysis was the job of the manufacturer rather than the wholesaler though 56% conceded that it was the job of both.

The discussion emphasized that most market research is largely the compilation and interpretation of already known material. The uses to which it can be put include balancing the wholesaler's coverage to the market by rearranging and reassigning territories, setting up sales potentials for each salesman, establishing sales quotas according to the potential, and checking the status of the company in the various territories.

A more detailed report of this very interesting discussion will be published in a later issue of the NEWS.

Aside from the president and president-elect previously mentioned, new officers and trustees of NHAW are as follows:

Vice president, Robert H. Swart, Grand Rapids, Mich.; secretary, Harry H. Jaeger, Trenton, N. J.; treasurer, R. J. Woodward, Columbus, Ohio.

Trustees: Region 1, George B. Sprick, New Haven, Conn.; Region 2, Fred Baumbach, Rochester, N. Y.; Region 3, Louis L. Glascock, Greensboro, N. C.; Region 4, Dan Julian, Hamilton, Ohio; Region 5, Joe M. David, Decatur, Ill.; Region 6, A. E. Bennett, Omaha, Neb.; Region 7, Vince G. Shields, Jr., Birmingham, Ala.; Region 8, J. L. Jones, Muskogee, Okla.; Region 9, Malcolm B. Nicholson, Denver; Region 10, Robert R. Nickerson, Santa Ana, Calif.; Ralph Ayers, Toronto, Ont., Can.; D. F. O'Brien, Seattle; and Garrett.

Ayers, by virtue of enrolling seven new members last year, became president of NHAW's Booster Club. Emery Lillard of Walnut Creek, Calif., became vice president.

ARI Training Program--

(Continued from Page 1, Col. 2)

and refrigeration courses in their vocational departments, the new training director would draft a curriculum, list of needs, and other material necessary to establishing the public school courses.

A start already has been made in this direction through the pilot program conducted in the public schools of Syracuse, N. Y. last year under the guidance of the committee chairman.

The Syracuse program includes a day-time course for regularly-enrolled high school students, and a night course for adults, meeting evenings, and utilizing the same public school facilities.

Need for such a training program has been expressed many times by manufacturers of the industry's equipment, it was noted. One spokesman for the industry has said that twice as much equipment could be sold if adequate personnel were available to install, maintain, and service it.

10,000-Home Project In Phoenix--

(Continued from Page 1, Col. 1)

Desert Air Conditioning Co. and Charles Roberts Air Conditioning Co. The announcement was made at the convention of the National Assn. of Home Builders here.

He said his organization will build 1,600 homes in 1962 in six different developments, and will complete the Park Phoenix program of 10,000 homes by 1964.

Other projects of the builder embrace 6,000 additional homes in the Phoenix area. He has already completed 9,000 houses.

Frank E. Purcell, Carrier packaged-equipment sales manager, termed the arrangement the largest, in number of homes involved, in the air conditioning industry history.

Install...service...
find and fix leaks
EVERYTHING
YOU NEED
FOR ONLY
$43.00!

PREST-O-LITE Refrigeration and Air Conditioning Outfit—a "business in a box" for only $43.00! Contains every essential piece of equipment you need!

You get 3 interchangeable open-flame stems to provide the right air-acetylene flame for soldering, brazing or heating. You can pinpoint the tiniest halide gas leaks (as little as 100 parts in 1,000,000 parts of air!) by fitting the sensitive leak detector stem to the same torch handle.

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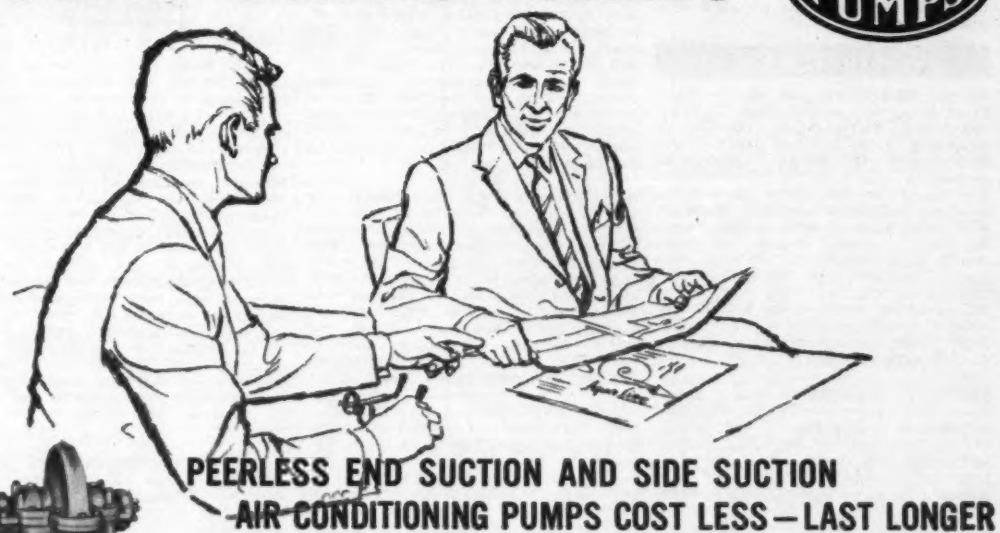
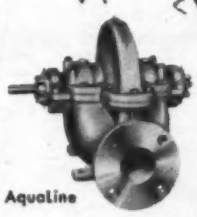
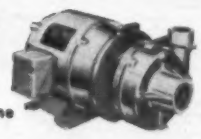


PEERLESS END SUCTION AND SIDE SUCTION
AIR CONDITIONING PUMPS COST LESS—LAST LONGER



AquaLine



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PEERLESS AQUALINE® Pumps are available in sizes to 8-inches. Capacities to 2600 gpm, heads to 280 feet. Temperatures to 250°F. Horizontal split case design allows quick inspection without disturbing piping.

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If there is a key word to describe Peerless Pumps, that word is QUALITY. You'll find it in the way the pumps are designed. You'll find it in the way the pumps are made. And you'll find it most apparent in the way these pumps operate. Remarkably long trouble-free operating records are routine with these better-made pumps.

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PATENTS *Week of Aug. 1*

2,994,121. METHOD OF MAKING A SEMICONDUCTIVE SWITCHING ARRAY. William Shockley, 23466 Corta Via, Los Altos, Calif.

1. The method of making a semiconductive switching array which comprises the steps of forming a slice of semiconductive material having the desired compositional structure, forming a plurality of elongated parallel ohmic contacts on one surface thereof, forming a plurality of elongated parallel ohmic contacts on the other surface thereof, said first and second contacts forming an angle with respect to one another, and removing the semiconductive material which lies between the ohmic contacts whereby switching devices are formed at each crossing of the first and second contacts.

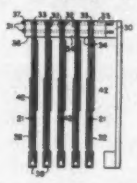
2,994,123. METHOD OF FORMING HEAT TRANSFER UNITS. Richard W. Kritzer, c/o Peerless of America, 580 N. Pulaski Rd., Chicago, Ill.

The method of fabricating finned heat transfer tubing from a flat strip of sheet metal stock and cylindrical tube stock which comprises: establishing a series of equally spaced parallel fold lines transversely of the strip and medially of the ends, thereof, forming in said strip a small perforation at each established fold line, forming in said strip between each adjacent pair of fold lines a row of

spaced circular tube openings surrounded by annular flanges which project out of the plane of the stock with said rows extending in alignment. . . .

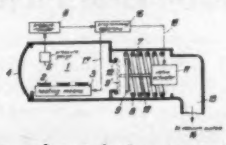
2,994,128. APPARATUS FOR ASSEMBLING COLLECTING CELLS FOR ELECTROSTATIC PRECIPITATORS. Gaylord W. Penney, c/o Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pa.

1. Apparatus for assembling collecting cells for electrostatic precipitators, said cells having two sets of opposed plates, the plates of one set alternating with the plates of the other set and being spaced parallel to but away from each other by flexible dielectric threads passing through spaced holes in the plates, the portions of the threads between the plates forming an angle with the plates when the cells are in operative position, said apparatus comprising a fixture for holding a first set of said sets of plates, said fixture comprising a plurality of pairs of opposed flat elongated fingers, each pair extending substantially the full extent of one



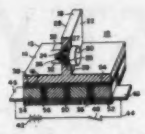
dimension of a plate and holding a plate between them, there being a series of pairs in the same plane, each series holding the same plate and spaced from each other substantially across the plate along the dimension of the plate at right angles to the direction in which the fingers extend....

2,994,132. FREEZE DRYING APPARATUS. Karlheinz Neumann, Bonner Strasse 498a, Koln-Bayental, Germany.



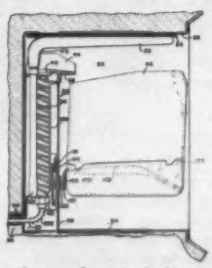
1. In a freeze-drying apparatus for use in removing admixed ice and absorbed ice from materials by sublimation and evaporation respectively, a drying chamber wherein said materials to be freeze-dried are placed, a condensing chamber communicating with said drying chamber and having means for condensing water vapor withdrawn from said drying chamber, valve means for sealing said chambers from each other, said valve means being normally open during freeze-drying operation. . . .

2,994,203. THERMOELECTRIC COOLING DEVICE. Robert S. Lackey, Pittsburgh, and Jack D. Meess, Export, Pa., assignors to Westinghouse Electric Corp.



1. A thermoelectric device capable of supporting and effectively cooling an electrical component comprising, a base plate, said base plate being comprised of a metal having a high thermal conductivity, at least one pair of thermoelectric elements having a junction in thermal conductive contact with one surface of said base plate, said thermoelectric elements being wholly electrically insulated from said base plate, a metallic member having a high thermal conductivity projecting from the opposite surfaces of said base plate, said member having a surface upon which at least one electrical component can be mounted for support in a readily accessible position and for intimate contact therewith so that heat may flow from the electrical component to the metallic member and thence to the base plate. . . .

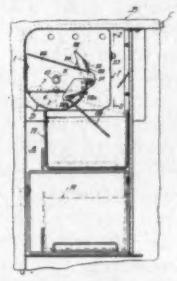
2,994,205. REFRIGERATING APPARATUS. James F. Brubaker and Richard S. Gaugler, Dayton, Ohio, assignors to General Motors Corp., Detroit, Mich.



1. An ice maker including a freezing cell, means for cooling said cell below water freezing temperatures, a source of water under pressure, a pump having an inlet connecting to said source and a discharge outlet, said discharge outlet being provided with a high pressure relief valve having a higher escape pressure than the pressure of said source, fluid conduit means extending from said relief valve to said freezing cell, and pressure responsive means responsive to a low pressure in said fluid conduit means for preventing the forcing of water through said relief valve when the pressure within said conduit means is below a predetermined minimum.

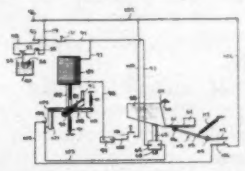
2,994,206. AUTOMATIC ICE CUBE MAKER. Lyle F. Shaw, Muskegon, and Clyde F. Baker, Muskegon Heights, Mich., assignors to Borg-Warner Corp., Chicago, Ill.

1. In an ice making machine, a container for receiving water; refrigerating means for freezing the water into ice; means for removing the ice from the container; a receptacle for receiving the removed ice; electrically-operated power means for actuating said ice-removing means; means for controlling energization of said power means including an electric circuit having a first normally open switch



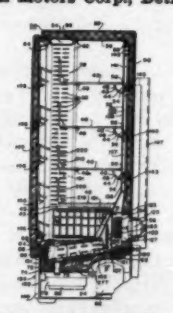
and a second normally closed switch, said first and second switches being arranged in parallel relationship in said circuit. . . .

2,994,204. AUTOMATIC ICE MAKING APPARATUS. Erling B. Archer, 33—74 191st St., Flushing, N. Y.



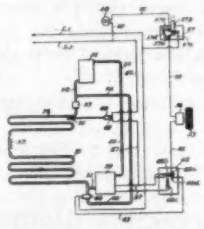
1. In combination with a household refrigerator equipped with a freezer compartment; resiliently deformable ice mold means made of elastic synthetic plastic material and mounted within said freezer compartment, conduit means leading to said ice mold means, valve means arranged in said conduit means and controlling the flow of water therethrough, and solenoid means operatively connected to said ice mold means and said valve means and operable cyclically and in timed sequence to first cause said ice mold means to be subjected to at least one mold-deforming and ice-ejecting impact. . . .

2,994,207. REFRIGERATING APPARATUS WITH DEFROSTING CONTROLS. John J. Preotle and Charles E. Rembold, Dayton, Ohio, assignors to General Motors Corp., Detroit, Mich.



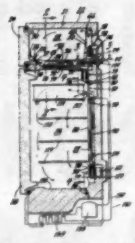
1. A refrigerator including an insulated cabinet containing a storage compartment and an evaporator compartment, a refrigerant evaporator in said evaporator compartment, electrically operated fan means for circulating air from said storage compartment into heat transfer relation with said evaporator and back to said storage compartment, liquefying means for supplying liquid refrigerant to and withdrawing evaporated refrigerant from said evaporator, electrical defrost heating means associated with said evaporator. . . .

2,994,208. REFRIGERATING APPARATUS HAVING FROST-ELIMINATING MEANS. Warren A. Hanson, St. Paul, Minn., assignor to Whirlpool Corp.



1. Refrigeration apparatus, comprising: means defining a first chamber and a second chamber; means defining a passage between said chambers; a first evaporator for cooling the chambers to a first freezing temperature; a second evaporator; surface means extending across said passage and defining a plurality of small air flow passages between said chambers, said surface means being cooled by the second evaporator to a second temperature below said first temperature; means selectively circulating cooling refrigerant through both evaporators....

2,994,209. FROSTLESS REFRIGERATOR. Leonard J. Mann, Edgar C. Robbins, and Clifford H. Wurtz, Dayton, Ohio, assignors to General Motors Corp., Detroit, Mich.



1. A refrigerator including an insulated cabinet having a storage compartment, said compartment having a door and door opening on one upright wall and top and side and rear upright walls, upwardly extending duct means on one of said upright walls provided with an upwardly directed outlet, means for cooling air and circulating the cooled air through said duct means into said compartment and discharging the cooled air from said outlet. . . .

(To Be Continued)

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SERVICE ENGINEER — 20 years' diversified experience in domestic and commercial refrigeration, air conditioning and heating including layout, estimating, etc. Desire permanent position with company possibly as field engineer or sales representative. Presently self employed and located in Midwest. Will travel. Certificate member and active in RSES. BOX A6927, Air Conditioning, Heating & Refrigeration News.

SERVICE ENGINEER, 39 years old, 15 years' experience. Commercial and industrial refrigeration and air conditioning. Extensive knowledge of low temperature applications. Experience includes, service installations, supervising, application, compressor rebuilding, and sales. Seeking position with good reliable firm. Can supply excellent references. BOX A6928, Air Conditioning, Heating & Refrigeration News.

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REFRIGERATION ENGINEER to take charge of department for progressive northern Ohio food processor. All Freon equipment. Lifetime opportunity for man experienced in industrial refrigeration construction, operation and maintenance. Present man leaving due to health; will train successor. Send complete resume and salary desired. All replies confidential. BOX A6924, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER—Long established New York City air conditioning contractor has opportunity for man who wants to get ahead. If you possess salesmanship and business ability to take over, we offer an opportunity to share in our successful business. Replies held in strictest confidence. Send resume to BOX A6930, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER for established York associated distributor. Want experienced man qualified to make contacts, design, make load calculations, quotations and complete sale — ammonia and Freon. Good opportunity for experienced sales engineer, professional preferred, with 63 year old organization. Location, Portland, Oregon. BOX A6931, Air Conditioning, Heating & Refrigeration News.

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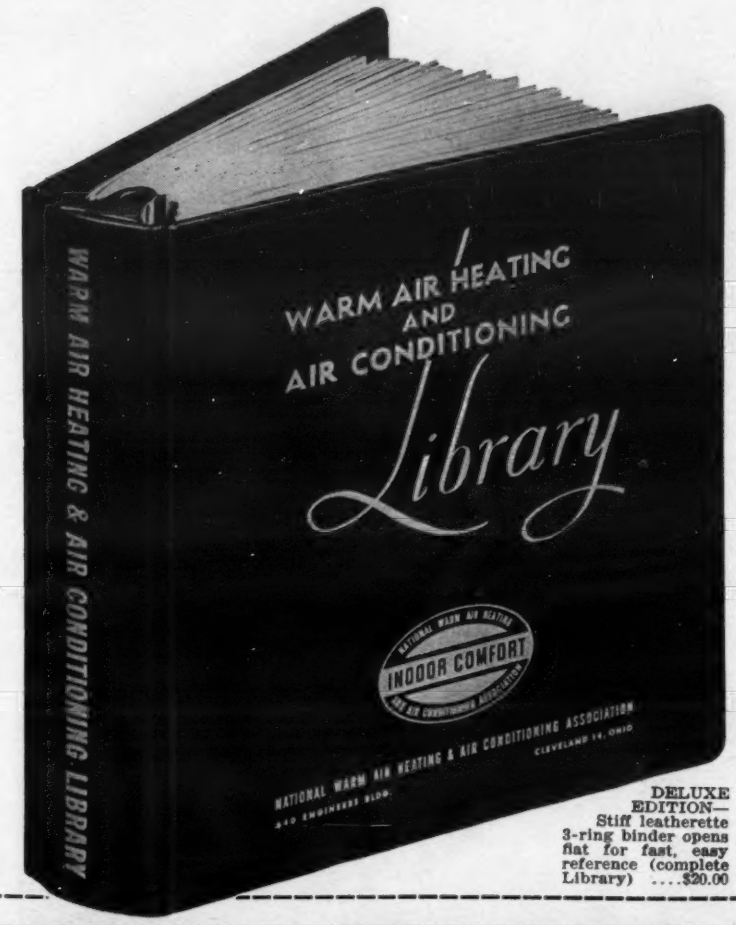
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Manual J — Load Calculation 2.50
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(Continued from Page 1, Col. 4)

placement either on a slab outside the residence or flush-mounted through an outside wall. System may be combined with either an up-flow or counterflow warm air furnace and uses furnace blower for air circulation.

Speedy installation is made possible because both sections and the connecting tubing are pre-charged at the factory, the division said.

"Tubing is equipped with spring type 10-in. tube benders and is easily positioned and connected to the condensing unit by twist-on couplings," it was stated.

"Purging, charging, and testing operations are eliminated, and the possibility of leaks, compressor failure, or inefficient operation—most often the result of improper field charging—is reduced substantially.

"The simplified hook-up also means that this task may be performed by any mechanic, freeing refrigeration specialists and engineers for more complex assignments.

Apartment System

"The apartment system, model APT-19, is designed primarily for the expanding multiple housing market and is particularly suited to low-rise and garden apartments and row houses.

"The condensing unit is encased in a sturdy steel cabinet. It is installed through the wall, with an inconspicuous grille mounted flush against the exterior wall face.

"For simplified installation, the unit is sized to occupy the vertical space normally required by four courses of standard concrete or cinder block or twelve brick courses. It is rated at 19,000 Btu, sufficient to cool the average apartment or small home.

"In a typical utility room installation, the condensing unit may be mounted high on the wall and the floor space beneath it reserved for a washer, dryer, or counter-top electric water heater. With the evaporator mounted above or below the furnace, such an installation conserves valuable floor space and is easily adapted to existing structures."

AC-PC Model

The AC-PC is rated at 20,000 Btu and is designed for installation of the condensing unit on a slab outside the home. Pre-charged tubing from the evaporator is easily slipped through a small 3-in. hole in the outside wall and coupled on to the condensing unit with the twist connectors, it was pointed out.

"Both systems have interchangeable parts and both feature high capacity, low-speed condenser fans for minimum noise and high condenser efficiency," the division said. "Indoor control panel supplied as standard equipment permits use of a more accurate low-voltage thermostat.

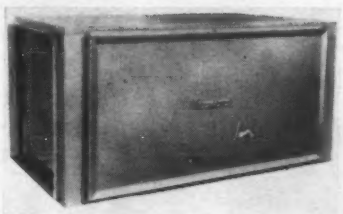
"Both systems may be obtained with or without the evaporator cabinet. Pre-charged tubing is normally supplied in 18-ft lengths, but may be obtained on special order in length up to 24 ft.

"Tubing is shipped coiled against the face of the evaporator, and it is only necessary to uncoil as much as needed to make the connection to the condensing unit. The remaining tubing serves to add additional refrigerated cooling surface to the coil."

The new electric furnaces employ belt-driven, two-speed blowers with adjustable pulleys and are available in ratings from 34,100 to 68,300 Btu. They are "priced competitively with gas-fired furnaces of equivalent ratings."

"The sturdy, unitized cabinets are fully insulated around the heater compartment and may be installed in horizontal, upflow, or counterflow positions," the announcement said.

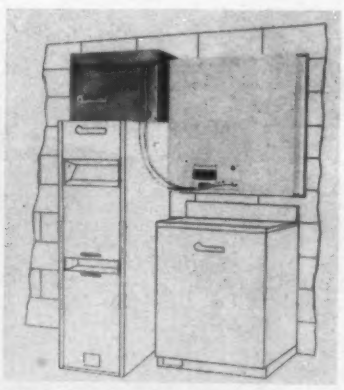
"Heating elements of the durable microme wire type are



NEW American-Standard electric furnace.

turned on in sequence by means of a cam-operated, five-stage switch with stages approximately two minutes apart. The blower operates at low speed initially and automatically shifts to high speed after warm-up.

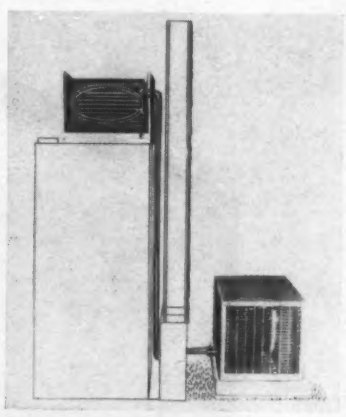
"The furnaces are approximately 20 in. square and slightly more than 42 in. high, excluding 1-in. duct flanges at either end. These compact dimensions permit installation in alcoves, closets, basements, or attics. For counterflow applications on combustible flooring, a 2-in. sub-base is obtainable.



AMERICAN-STANDARD model APT central year-round system plus an electric water heater can be installed in utility closet only 5 ft by 2½ ft.

"All units are factory wired for 240-volt operation.

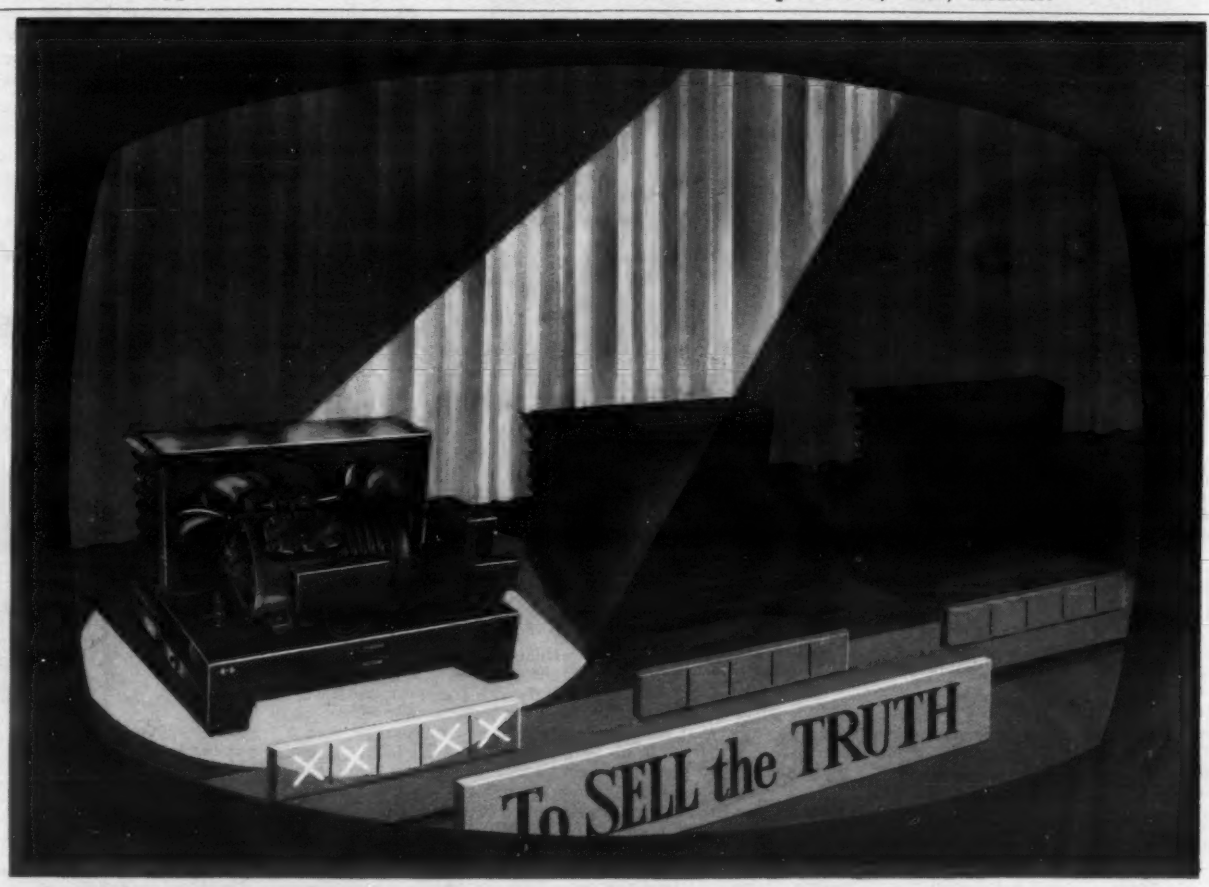
"Standard equipment includes a transformer to permit use of low voltage heat anticipating thermostats, limit control, auxiliary limit control for reverse air flow protection, filter,



AMERICAN-STANDARD pre-charged evaporator can be located on top or underneath warm air furnace. Outdoor condensing unit is connected with pre-charged tubing.

and timed cycling room thermostat.

"Optional equipment available includes sub-base, side filter frame, and automatic humidifier."



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